HP ProLiant DL385 Generation 5 Server Maintenance and Service Guide

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Intended audience

This guide is for an experienced service technician. HP assumes you are qualified in the servicing of computer equipment and trained in recognizing hazards in products with hazardous energy levels and are familiar with weight and stability precautions for rack installations.

Contents

Customer self repair

HP products are designed with many Customer Self Repair (CSR) parts to minimize repair time and allow for greater flexibility in performing defective parts replacement. If during the diagnosis period HP (or HP service providers or service partners) identifies that the repair can be accomplished by the use of a CSR part, HP will ship that part directly to you for replacement. There are two categories of CSR parts:

- **Mandatory**—Parts for which customer self repair is mandatory. If you request HP to replace these parts, you will be charged for the travel and labor costs of this service.
- **Optional**—Parts for which customer self repair is optional. These parts are also designed for customer self repair. If, however, you require that HP replace them for you, there may or may not be additional charges, depending on the type of warranty service designated for your product.

NOTE: Some HP parts are not designed for customer self repair. In order to satisfy the customer warranty, HP requires that an authorized service provider replace the part. These parts are identified as "No" in the Illustrated Parts Catalog.

Based on availability and where geography permits, CSR parts will be shipped for next business day delivery. Same day or four-hour delivery may be offered at an additional charge where geography permits. If assistance is required, you can call the HP Technical Support Center and a technician will help you over the telephone. HP specifies in the materials shipped with a replacement CSR part whether a defective part must be returned to HP. In cases where it is required to return the defective part to HP, you must ship the defective part back to HP within a defined period of time, normally five (5) business days. The defective part must be returned with the associated documentation in the provided shipping material. Failure to return the defective part may result in HP billing you for the replacement. With a customer self repair, HP will pay all shipping and part return costs and determine the courier/carrier to be used.

For more information about HP's Customer Self Repair program, contact your local service provider. For the North American program, refer to the HP website (http://www.hp.com/go/selfrepair).

Parts only warranty service

Your HP Limited Warranty may include a parts only warranty service. Under the terms of parts only warranty service, HP will provide replacement parts free of charge.

For parts only warranty service, CSR part replacement is mandatory. If you request HP to replace these parts, you will be charged for the travel and labor costs of this service.

Réparation par le client (CSR)

Les produits HP comportent de nombreuses pièces CSR (Customer Self Repair = réparation par le client) afin de minimiser les délais de réparation et faciliter le remplacement des pièces défectueuses. Si pendant la période de diagnostic, HP (ou ses partenaires ou mainteneurs agréés) détermine que la réparation peut être effectuée à l'aide d'une pièce CSR, HP vous l'envoie directement. Il existe deux catégories de pièces CSR:

- **Obligatoire** - Pièces pour lesquelles la réparation par le client est obligatoire. Si vous demandez à HP de remplacer ces pièces, les coûts de déplacement et main d'œuvre du service vous seront facturés.
- **Facultatif** - Pièces pour lesquelles la réparation par le client est facultative. Ces pièces sont également conçues pour permettre au client d'effectuer lui-même la réparation. Toutefois, si vous demandez à HP de remplacer ces pièces, l'intervention peut ou non vous être facturée, selon le type de garantie applicable à votre produit.

REMARQUE: Certaines pièces HP ne sont pas conçues pour permettre au client d'effectuer lui-même la réparation. Pour que la garantie puisse s'appliquer, HP exige que le remplacement de la pièce soit effectué par un Mainteneur Agréé. Ces pièces sont identifiées par la mention "Non" dans le Catalogue illustré.

Les pièces CSR sont livrées le jour ouvré suivant, dans la limite des stocks disponibles et selon votre situation géographique. Si votre situation géographique le permet et que vous demandez une livraison le jour même ou dans les 4 heures, celle-ci vous sera facturée. Pour bénéficier d'une assistance téléphonique, appelez le Centre d'assistance technique HP. Dans les documents envoyés avec la pièce de rechange CSR, HP précise s'il est nécessaire de lui retourner la pièce défectueuse. Si c'est le cas, vous devez le faire dans le délai indiqué, généralement cinq (5) jours ouvrés. La pièce et sa documentation doivent être retournées dans l'emballage fourni. Si vous ne retournez pas la pièce défectueuse, HP se réserve le droit de vous facturer les coûts de remplacement. Dans le cas d'une pièce CSR, HP supporte l'ensemble des frais d'expédition et de retour, et détermine la société de courses ou le transporteur à utiliser.

Pour plus d'informations sur le programme CSR de HP, contactez votre Mainteneur Agrée local. Pour plus d'informations sur ce programme en Amérique du Nord, consultez le site Web HP (http://www.hp.com/go/selfrepair).

Service de garantie "pièces seules"

Votre garantie limitée HP peut inclure un service de garantie "pièces seules". Dans ce cas, les pièces de rechange fournies par HP ne sont pas facturées.

Dans le cadre de ce service, la réparation des pièces CSR par le client est obligatoire. Si vous demandez à HP de remplacer ces pièces, les coûts de déplacement et main d'œuvre du service vous seront facturés.

Riparazione da parte del cliente

Per abbreviare i tempi di riparazione e garantire una maggiore flessibilità nella sostituzione di parti difettose, i prodotti HP sono realizzati con numerosi componenti che possono essere riparati direttamente dal cliente (CSR, Customer Self Repair). Se in fase di diagnostica HP (o un centro di servizi o di assistenza HP) identifica il guasto come riparabile mediante un ricambio CSR, HP lo spedirà direttamente al cliente per la sostituzione. Vi sono due categorie di parti CSR:

- **Obbligatorie** – Parti che devono essere necessariamente riparate dal cliente. Se il cliente ne affida la riparazione ad HP, deve sostenere le spese di spedizione e di manodopera per il servizio.
- **Opzionali** – Parti la cui riparazione da parte del cliente è facoltativa. Si tratta comunque di componenti progettati per questo scopo. Se tuttavia il cliente ne richiede la sostituzione ad HP, potrebbe dover sostenere spese addizionali a seconda del tipo di garanzia previsto per il prodotto.

NOTA: alcuni componenti HP non sono progettati per la riparazione da parte del cliente. Per rispettare la garanzia, HP richiede che queste parti siano sostituite da un centro di assistenza autorizzato. Tali parti sono identificate da un "No" nel Catalogo illustrato dei componenti.

In base alla disponibilità e alla località geografica, le parti CSR vengono spedite con consegna entro il giorno lavorativo seguente. La consegna nel giorno stesso o entro quattro ore è offerta con un supplemento di costo solo in alcune zone. In caso di necessità si può richiedere l'assistenza telefonica di un addetto del centro di supporto tecnico HP. Nel materiale fornito con una parte di ricambio CSR, HP specifica se il cliente deve restituire dei componenti. Qualora sia richiesta la resa ad HP del componente difettoso, lo si deve spedire ad HP entro un determinato periodo di tempo, generalmente cinque (5) giorni lavorativi. Il componente difettoso deve essere restituito con la documentazione associata nell'imballo di spedizione fornito. La mancata restituzione del componente può comportare la fatturazione del ricambio da parte di HP. Nel caso di riparazione da parte del cliente, HP sostiene tutte le spese di spedizione e resa e sceglie il corriere/vettore da utilizzare.

Per ulteriori informazioni sul programma CSR di HP contattare il centro di assistenza di zona. Per il programma in Nord America fare riferimento al sito Web HP (http://www.hp.com/go/selfrepair).

Servizio di garanzia per i soli componenti

La garanzia limitata HP può includere un servizio di garanzia per i soli componenti. Nei termini di garanzia del servizio per i soli componenti, HP fornirà gratuitamente le parti di ricambio.

Per il servizio di garanzia per i soli componenti è obbligatoria la formula CSR che prevede la riparazione da parte del cliente. Se il cliente invece richiede la sostituzione ad HP, dovrà sostenere le spese di spedizione e di manodopera per il servizio.

Customer Self Repair

HP Produkte enthalten viele CSR-Teile (Customer Self Repair), um Reparaturzeiten zu minimieren und höhere Flexibilität beim Austausch defekter Bauteile zu ermöglichen. Wenn HP (oder ein HP Servicepartner) bei der Diagnose feststellt, dass das Produkt mithilfe eines CSR-Teils repariert werden kann, sendet Ihnen HP dieses Bauteil zum Austausch direkt zu. CSR-Teile werden in zwei Kategorien unterteilt:

- **Zwingend –** Teile, für die das Customer Self Repair-Verfahren zwingend vorgegeben ist. Wenn Sie den Austausch dieser Teile von HP vornehmen lassen, werden Ihnen die Anfahrt- und Arbeitskosten für diesen Service berechnet.
- **Optional –** Teile, für die das Customer Self Repair-Verfahren optional ist. Diese Teile sind auch für Customer Self Repair ausgelegt. Wenn Sie jedoch den Austausch dieser Teile von HP vornehmen lassen möchten, können bei diesem Service je nach den für Ihr Produkt vorgesehenen Garantiebedingungen zusätzliche Kosten anfallen.

HINWEIS: Einige Teile sind nicht für Customer Self Repair ausgelegt. Um den Garantieanspruch des Kunden zu erfüllen, muss das Teil von einem HP Servicepartner ersetzt werden. Im illustrierten Teilekatalog sind diese Teile mit „No“ bzw. „Nein“ gekennzeichnet.

CSR-Teile werden abhängig von der Verfügbarkeit und vom Lieferziel am folgenden Geschäftstag geliefert. Für bestimmte Standorte ist eine Lieferung am selben Tag oder innerhalb von vier Stunden gegen einen Aufpreis verfügbar. Wenn Sie Hilfe benötigen, können Sie das HP technische Support Center

anrufen und sich von einem Mitarbeiter per Telefon helfen lassen. Den Materialien, die mit einem CSR-Ersatzteil geliefert werden, können Sie entnehmen, ob das defekte Teil an HP zurückgeschickt werden muss. Wenn es erforderlich ist, das defekte Teil an HP zurückzuschicken, müssen Sie dies innerhalb eines vorgegebenen Zeitraums tun, in der Regel innerhalb von fünf (5) Geschäftstagen. Das defekte Teil muss mit der zugehörigen Dokumentation in der Verpackung zurückgeschickt werden, die im Lieferumfang enthalten ist. Wenn Sie das defekte Teil nicht zurückschicken, kann HP Ihnen das Ersatzteil in Rechnung stellen. Im Falle von Customer Self Repair kommt HP für alle Kosten für die Lieferung und Rücksendung auf und bestimmt den Kurier-/Frachtdienst.

Weitere Informationen über das HP Customer Self Repair Programm erhalten Sie von Ihrem Servicepartner vor Ort. Informationen über das CSR-Programm in Nordamerika finden Sie auf der HP Website unter (http://www.hp.com/go/selfrepair).

Parts-only Warranty Service (Garantieservice ausschließlich für Teile)

Ihre HP Garantie umfasst möglicherweise einen Parts-only Warranty Service (Garantieservice ausschließlich für Teile). Gemäß den Bestimmungen des Parts-only Warranty Service stellt HP Ersatzteile kostenlos zur Verfügung.

Für den Parts-only Warranty Service ist das CSR-Verfahren zwingend vorgegeben. Wenn Sie den Austausch dieser Teile von HP vornehmen lassen, werden Ihnen die Anfahrt- und Arbeitskosten für diesen Service berechnet.

Reparaciones del propio cliente

Los productos de HP incluyen muchos componentes que el propio usuario puede reemplazar (*Customer Self Repair*, CSR) para minimizar el tiempo de reparación y ofrecer una mayor flexibilidad a la hora de realizar sustituciones de componentes defectuosos. Si, durante la fase de diagnóstico, HP (o los proveedores o socios de servicio de HP) identifica que una reparación puede llevarse a cabo mediante el uso de un componente CSR, HP le enviará dicho componente directamente para que realice su sustitución. Los componentes CSR se clasifican en dos categorías:

- **Obligatorio:** componentes para los que la reparación por parte del usuario es obligatoria. Si solicita a HP que realice la sustitución de estos componentes, tendrá que hacerse cargo de los gastos de desplazamiento y de mano de obra de dicho servicio.
- **Opcional:** componentes para los que la reparación por parte del usuario es opcional. Estos componentes también están diseñados para que puedan ser reparados por el usuario. Sin embargo, si precisa que HP realice su sustitución, puede o no conllevar costes adicionales, dependiendo del tipo de servicio de garantía correspondiente al producto.

NOTA: Algunos componentes no están diseñados para que puedan ser reparados por el usuario. Para que el usuario haga valer su garantía, HP pone como condición que un proveedor de servicios autorizado realice la sustitución de estos componentes. Dichos componentes se identifican con la palabra "No" en el catálogo ilustrado de componentes.

Según la disponibilidad y la situación geográfica, los componentes CSR se enviarán para que lleguen a su destino al siguiente día laborable. Si la situación geográfica lo permite, se puede solicitar la entrega en el mismo día o en cuatro horas con un coste adicional. Si precisa asistencia técnica, puede llamar al

Centro de asistencia técnica de HP y recibirá ayuda telefónica por parte de un técnico. Con el envío de materiales para la sustitución de componentes CSR, HP especificará si los componentes defectuosos deberán devolverse a HP. En aquellos casos en los que sea necesario devolver algún componente a HP, deberá hacerlo en el periodo de tiempo especificado, normalmente cinco días laborables. Los componentes defectuosos deberán devolverse con toda la documentación relacionada y con el embalaje de envío. Si no enviara el componente defectuoso requerido, HP podrá cobrarle por el de sustitución. En el caso de todas sustituciones que lleve a cabo el cliente, HP se hará cargo de todos los gastos de envío y devolución de componentes y escogerá la empresa de transporte que se utilice para dicho servicio.

Para obtener más información acerca del programa de Reparaciones del propio cliente de HP, póngase en contacto con su proveedor de servicios local. Si está interesado en el programa para Norteamérica, visite la página web de HP siguiente (http://www.hp.com/go/selfrepair).

Servicio de garantía exclusivo de componentes

La garantía limitada de HP puede que incluya un servicio de garantía exclusivo de componentes. Según las condiciones de este servicio exclusivo de componentes, HP le facilitará los componentes de repuesto sin cargo adicional alguno.

Para este servicio de garantía exclusivo de componentes, es obligatoria la sustitución de componentes por parte del usuario (CSR). Si solicita a HP que realice la sustitución de estos componentes, tendrá que hacerse cargo de los gastos de desplazamiento y de mano de obra de dicho servicio.

Customer Self Repair

Veel onderdelen in HP producten zijn door de klant zelf te repareren, waardoor de reparatieduur tot een minimum beperkt kan blijven en de flexibiliteit in het vervangen van defecte onderdelen groter is. Deze onderdelen worden CSR-onderdelen (Customer Self Repair) genoemd. Als HP (of een HP Service Partner) bij de diagnose vaststelt dat de reparatie kan worden uitgevoerd met een CSR-onderdeel, verzendt HP dat onderdeel rechtstreeks naar u, zodat u het defecte onderdeel daarmee kunt vervangen. Er zijn twee categorieën CSR-onderdelen:

- **Verplicht:** Onderdelen waarvoor reparatie door de klant verplicht is. Als u HP verzoekt deze onderdelen voor u te vervangen, worden u voor deze service reiskosten en arbeidsloon in rekening gebracht.
- **Optioneel:** Onderdelen waarvoor reparatie door de klant optioneel is. Ook deze onderdelen zijn ontworpen voor reparatie door de klant. Als u echter HP verzoekt deze onderdelen voor u te vervangen, kunnen daarvoor extra kosten in rekening worden gebracht, afhankelijk van het type garantieservice voor het product.

OPMERKING: Sommige HP onderdelen zijn niet ontwikkeld voor reparatie door de klant. In verband met de garantievoorwaarden moet het onderdeel door een geautoriseerde Service Partner worden vervangen. Deze onderdelen worden in de geïllustreerde onderdelencatalogus aangemerkt met "Nee".

Afhankelijk van de leverbaarheid en de locatie worden CSR-onderdelen verzonden voor levering op de eerstvolgende werkdag. Levering op dezelfde dag of binnen vier uur kan tegen meerkosten worden aangeboden, indien dit mogelijk is gezien de locatie. Indien assistentie gewenst is, belt u een HP Service Partner om via de telefoon technische ondersteuning te ontvangen. HP vermeldt in de documentatie bij het vervangende CSR-onderdeel of het defecte onderdeel aan HP moet worden geretourneerd. Als het defecte onderdeel aan HP moet worden teruggezonden, moet u het defecte onderdeel binnen een bepaalde

periode, gewoonlijk vijf (5) werkdagen, retourneren aan HP. Het defecte onderdeel moet met de bijbehorende documentatie worden geretourneerd in het meegeleverde verpakkingsmateriaal. Als u het defecte onderdeel niet terugzendt, kan HP u voor het vervangende onderdeel kosten in rekening brengen. Bij reparatie door de klant betaalt HP alle verzendkosten voor het vervangende en geretourneerde onderdeel en kiest HP zelf welke koerier/transportonderneming hiervoor wordt gebruikt.

Neem contact op met een Service Partner voor meer informatie over het Customer Self Repair programma van HP. Informatie over Service Partners vindt u op de HP website (http://www.hp.com/go/selfrepair).

Garantieservice "Parts Only"

Het is mogelijk dat de HP garantie alleen de garantieservice "Parts Only" omvat. Volgens de bepalingen van de Parts Only garantieservice zal HP kosteloos vervangende onderdelen ter beschikking stellen.

Voor de Parts Only garantieservice is vervanging door CSR-onderdelen verplicht. Als u HP verzoekt deze onderdelen voor u te vervangen, worden u voor deze service reiskosten en arbeidsloon in rekening gebracht.

Reparo feito pelo cliente

Os produtos da HP são projetados com muitas peças para reparo feito pelo cliente (CSR) de modo a minimizar o tempo de reparo e permitir maior flexibilidade na substituição de peças com defeito. Se, durante o período de diagnóstico, a HP (ou fornecedores/parceiros de serviço da HP) concluir que o reparo pode ser efetuado pelo uso de uma peça CSR, a peça de reposição será enviada diretamente ao cliente. Existem duas categorias de peças CSR:

- **Obrigatória** – Peças cujo reparo feito pelo cliente é obrigatório. Se desejar que a HP substitua essas peças, serão cobradas as despesas de transporte e mão-de-obra do serviço.
- **Opcional** – Peças cujo reparo feito pelo cliente é opcional. Essas peças também são projetadas para o reparo feito pelo cliente. No entanto, se desejar que a HP as substitua, pode haver ou não a cobrança de taxa adicional, dependendo do tipo de serviço de garantia destinado ao produto.

OBSERVAÇÃO: Algumas peças da HP não são projetadas para o reparo feito pelo cliente. A fim de cumprir a garantia do cliente, a HP exige que um técnico autorizado substitua a peça. Essas peças estão identificadas com a marca "No" (Não), no catálogo de peças ilustrado.

Conforme a disponibilidade e o local geográfico, as peças CSR serão enviadas no primeiro dia útil após o pedido. Onde as condições geográficas permitirem, a entrega no mesmo dia ou em quatro horas pode ser feita mediante uma taxa adicional. Se precisar de auxílio, entre em contato com o Centro de suporte técnico da HP para que um técnico o ajude por telefone. A HP especifica nos materiais fornecidos com a peça CSR de reposição se a peça com defeito deve ser devolvida à HP. Nos casos em que isso for necessário, é preciso enviar a peça com defeito à HP dentro do período determinado, normalmente cinco (5) dias úteis. A peça com defeito deve ser enviada com a documentação correspondente no material de transporte fornecido. Caso não o faça, a HP poderá cobrar a reposição. Para as peças de reparo feito pelo cliente, a HP paga todas as despesas de transporte e de devolução da peça e determina a transportadora/serviço postal a ser utilizado.

Para obter mais informações sobre o programa de reparo feito pelo cliente da HP, entre em contato com o fornecedor de serviços local. Para o programa norte-americano, visite o site da HP (http://www.hp.com/go/selfrepair).

Serviço de garantia apenas para peças

A garantia limitada da HP pode incluir um serviço de garantia apenas para peças. Segundo os termos do serviço de garantia apenas para peças, a HP fornece as peças de reposição sem cobrar nenhuma taxa.

No caso desse serviço, a substituição de peças CSR é obrigatória. Se desejar que a HP substitua essas peças, serão cobradas as despesas de transporte e mão-de-obra do serviço.

顧客自己修理保証サービス

修理時間を短縮し、故障部品の交換における高い柔軟性を確保するために、HP製品には多数の顧客自己修理（CSR）部品があります。診断の際に、CSR部品を使用すれば修理ができるとHP（HPまたはHP正規保守代理店）が判断した場合、HPはその部品を直接、お客様に発送し、お客様に交換していただきます。CSR部品には以下の2通りがあります。

- 必須 - 顧客自己修理が必須の部品。当該部品について、もしもお客様がHPに交換作業を依頼される場合には、その修理サービスに関する交通費および人件費がお客様に請求されます。
- 任意 - 顧客自己修理が任意である部品。この部品も顧客自己修理用です。当該部品について、もしもお客様がHPに交換作業を依頼される場合には、お買い上げの製品に適用される保証サービス内容の範囲内においては、別途費用を負担していただくことなく保証サービスを受けることができます。

注： HP製品の一部の部品は、顧客自己修理用ではありません。製品の保証を継続するためには、HPまたはHP正規保守代理店による交換作業が必須となります。部品カタログには、当該部品が顧客自己修理除外品である旨が記載されています。

部品供給が可能な場合、地域によっては、CSR部品を翌営業日に届くように発送します。また、地域によっては、追加費用を負担いただくことにより同日または4時間以内に届くように発送することも可能な場合があります。サポートが必要なときは、HPの修理受付窓口に電話していただければ、技術者が電話でアドバイスします。交換用のCSR部品または同梱物には、故障部品をHPに返送する必要があるかどうかが表示されています。故障部品をHPに返送する必要がある場合は、指定期限内（通常は5営業日以内）に故障部品をHPに返送してください。故障部品を返送する場合は、届いた時の梱包箱に関連書類とともに入れてください。故障部品を返送しない場合、HPから部品費用が請求されます。顧客自己修理の際には、HPは送料および部品返送費を全額負担し、使用する宅配便会社や運送会社を指定します。

部品のみ保証サービス

HP保証サービスには、部品のみ保証サービスが適用される場合があります。このサービスでは、交換部品は無償で提供されます。

部品のみ保証サービスにおいては、CSR部品をお客様により交換作業していただくことが必須となります。当該部品について、もしもお客様がHPに交換作業を依頼される場合には、その修理サービスに関する交通費および人件費はお客様の負担となります。

客户自行维修

HP 产品提供许多客户自行维修 (CSR) 部件，以尽可能缩短维修时间和在更换缺陷部件方面提供更大的灵活性。如果在诊断期间 HP（或 HP 服务提供商或服务合作伙伴）确定可以通过使用 CSR 部件完成维修，HP 将直接把该部件发送给您进行更换。有两类 CSR 部件：

- **强制性的** — 要求客户必须自行维修的部件。如果您请求 HP 更换这些部件，则必须为该服务支付差旅费和人工费用。
- **可选的** — 客户可以选择是否自行维修的部件。这些部件也是为客户自行维修设计的。不过，如果您要求 HP 为您更换这些部件，则根据为您的产品指定的保修服务类型，HP 可能收取或不再收取任何附加费用。

注：某些 HP 部件的设计并未考虑客户自行维修。为了满足客户保修的需要，HP 要求授权服务提供商更换相关部件。这些部件在部件图解目录中标记为“否”。

CSR 部件将在下一个工作日发运（取决于备货情况和允许的地理范围）。在允许的地理范围内，可在当天或四小时内发运，但要收取额外费用。如果需要帮助，您可以致电 HP 技术支持中心，将会有技术人员通过电话为您提供帮助。HP 会在随更换的 CSR 部件发运的材料中指明是否必须将有缺陷的部件返还给 HP。如果要求您将有缺陷的部件返还给 HP，那么您必须在规定期限内（通常是五 (5) 个工作日）将缺陷部件发给 HP。有缺陷的部件必须随所提供的发运材料中的相关文件一起返还。如果未能送还有缺陷的部件，HP 可能会要求您支付更换费用。客户自行维修时，HP 将承担所有相关运输和部件返回费用，并指定快递商/承运商。

有关 HP 客户自行维修计划的详细信息，请与您当地的服务提供商联系。有关北美地区的计划，请访问 HP 网站 (http://www.hp.com/go/selfrepair)。

仅部件保修服务

您的 HP 有限保修服务可能涉及仅部件保修服务。根据仅部件保修服务条款的规定，HP 将免费提供更换的部件。

仅部件保修服务要求进行 CSR 部件更换。如果您请求 HP 更换这些部件，则必须为该服务支付差旅费和人工费用。

客戶自行維修

HP 產品設計了許多「客戶自行維修」(CSR) 的零件以減少維修時間，並且使得更換瑕疵零件時能有更大的彈性。如果在診斷期間 HP（或 HP 服務供應商或維修夥伴）辨認出此項維修工作可以藉由使用 CSR 零件來完成，則 HP 將直接寄送該零件給您作更換。CSR 零件分為兩種類別：

- **強制的** — 客戶自行維修所使用的零件是強制性的。如果您要求 HP 更換這些零件，HP 將會向您收取此服務所需的外出費用與勞動成本。
- **選購的** — 客戶自行維修所使用的零件是選購的。這些零件也設計用於客戶自行維修之用。不過，如果您要求 HP 為您更換，則可能需要也可能不需要負擔額外的費用，端視針對此產品指定的保固服務類型而定。

備註：某些 HP 零件沒有消費者可自行維修的設計。為符合客戶保固，HP 需要授權的服務供應商更換零件。這些零件在圖示的零件目錄中，被標示為「否」。

基於材料取得及環境允許的情況下，CSR 零件將於下一個工作日以快遞寄送。在環境的允許下當天或四小時內送達，則可能需要額外的費用。若您需要協助，可致電「HP 技術支援中心」，會有一位技術人員透過電話來協助您。不論損壞的零件是否必須退回，HP 皆會在與 CSR 替換零件一起運送的材料中註明。若要將損壞的零件退回 HP，您必須在指定的一段時間內（通常為五 (5) 個工作天），將損壞的零件寄回 HP。損壞的零件必須與寄送資料中隨附的相關技術文件一併退還。如果無法退還損壞的零件，HP 可能要向您收取替換費用。針對客戶自行維修情形，HP 將負責所有運費及零件退還費用並指定使用何家快遞/貨運公司。

如需 HP 的「客戶自行維修」方案詳細資訊，請連絡您當地的服務供應商。至於北美方案，請參閱 HP 網站 (http://www.hp.com/go/selfrepair)。

僅限零件的保固服務

您的「HP 有限保固」可能包含僅限零件的保固服務。在僅限零件的保固服務情況下，HP 將免費提供替換零件。

針對僅限零件的保固服務，CSR 零件替換是強制性的。如果您要求 HP 更換這些零件，HP 將會向您收取此服務所需的外出費用與勞動成本。

고객 셀프 수리

HP 제품은 수리 시간을 최소화하고 결함이 있는 부품 교체 시 더욱 융통성을 발휘할 수 있도록 하기 위해 고객 셀프 수리(CSR) 부품을 다량 사용하여 설계되었습니다. 진단 기간 동안 HP(또는 HP 서비스 공급업체 또는 서비스 협력업체)에서 CSR 부품을 사용하여 수리가 가능하다고 판단되면 HP는 해당 부품을 바로 사용자에게 보내어 사용자가 교체할 수 있도록 합니다. CSR 부품에는 두 가지 종류가 있습니다.

- **고객 셀프 수리가 의무 사항인 필수 부품.** 사용자가 HP에 이 부품의 교체를 요청할 경우 이 서비스에 대한 출장비 및 작업비가 청구됩니다.
- **고객 셀프 수리가 선택 사항인 부품.** 이 부품들도 고객 셀프 수리가 가능하도록 설계되었습니다. 하지만 사용자가 HP에 이 부품의 교체를 요청할 경우 사용자가 구입한 제품에 해당하는 보증 서비스 유형에 따라 추가 비용 없이 교체가 가능할 수 있습니다.

참고: 일부 HP 부품은 고객 셀프 수리가 불가능하도록 설계되었습니다. HP는 만족스러운 고객 보증을 위해 공인 서비스 제공업체를 통해 부품을 교체하도록 하고 있습니다. 이러한 부품들은 Illustrated Parts Catalog에 "No"라고 표시되어 있습니다.

CSR 부품은 재고 상태와 지리적 조건이 허용하는 경우 다음 영업일 납품이 가능하도록 배송이 이루어집니다. 지리적 조건이 허용하는 경우 추가 비용이 청구되는 조건으로 당일 또는 4시간 배송이 가능할 수도 있습니다. 도움이 필요하시면 HP 기술 지원 센터로 전화하십시오. 전문 기술자가 전화로 도움을 줄 것입니다. HP는 결함이 발생한 부품을 HP로 반환해야 하는지 여부를 CSR 교체 부품과 함께 배송된 자료에 지정합니다. 결함이 발생한 부품을 HP로 반환해야 하는 경우에는 지정된 기간 내(통상 영업일 기준 5일)에 HP로 반환해야 합니다. 이 때 결함이 발생한 부품은 제공된 포장 재료에 넣어 관련 설명서와 함께 반환해야 합니다. 결함이 발생한 부품을 반환하지 않는 경우 HP가 교체 부품에 대해 비용을 청구할 수 있습니다. 고객 셀프 수리의 경우, HP는 모든 운송 및 부품 반환 비용을 부담하며 이용할 운송업체 및 택배 서비스를 결정합니다.

HP 고객 셀프 수리 프로그램에 대한 자세한 내용은 가까운 서비스 제공업체에 문의하십시오. 북미 지역의 프로그램에 대해서는 HP 웹 사이트(http://www.hp.com/go/selfrepair)를 참조하십시오.

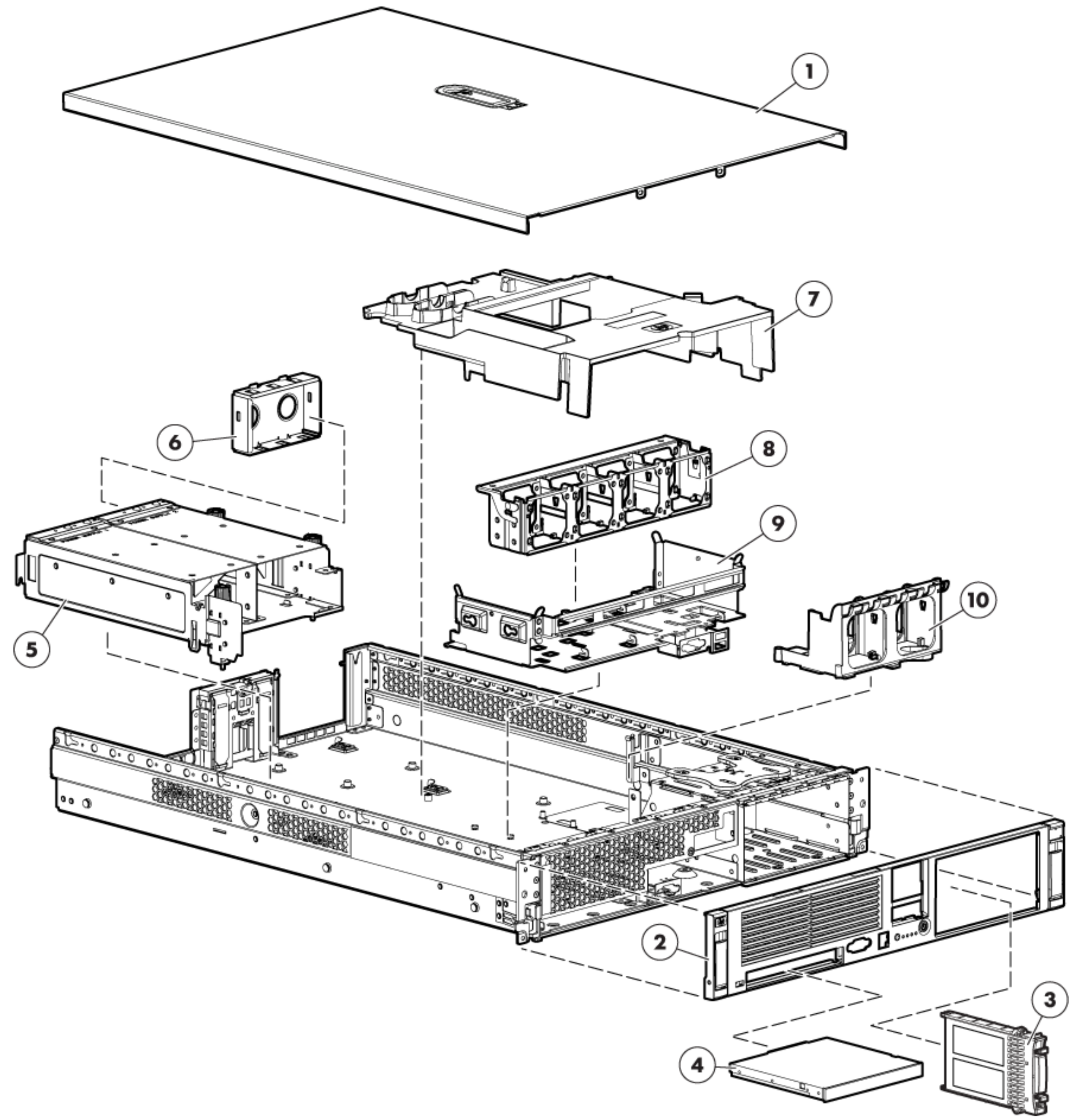
부품 제공 보증 서비스

HP 제한 보증에는 부품 제공 보증 서비스가 포함될 수 있습니다. 이러한 경우 HP는 부품 제공 보증 서비스의 조건에 따라 교체 부품만을 무료로 제공합니다.

부품 제공 보증 서비스 제공 시 CSR 부품 교체는 의무 사항입니다. 사용자가 HP에 이 부품의 교체를 요청할 경우 이 서비스에 대한 출장비 및 작업비가 청구됩니다.

Illustrated parts catalog

Mechanical components



Item	Description	Assembly part number	Spare part number	Customer self repair (on page 6)
1	Access panel	394037-001	407744-001	Mandatory[1]
2	Front bezel	394028-003	407745-001	Mandatory[1]

Item	Description	Assembly part number	Spare part number	Customer self repair (on page 6)
3	Hard drive blank	376383-001	392613-001	Mandatory[1]
4	Media drive blank	377569-001	409006-001	Mandatory[1]
5	Power supply cage assembly	394020-001	408785-001	Optional[2]
6	Power supply blank	394436-001	409417-001	Mandatory[1]
7	Air baffle	404847-001	430441-001	Mandatory[1]
8	Processor fan cage	463180-001	496067-001	Mandatory[1]
9	Processor fan bracket plate	419341-002	430371-001	Optional[2]
10	I/O fan bracket	419315-001	408784-001	Optional[2]
11	Hardware kit*	—	407752-001	Mandatory[1]
	a) Retainer spring	397450-001	—	—
	b) Screws, 6-32 × 0.250 TF, hi-top (4) (media drive ejector assembly, media drive cable, external option blank)	192308-009	—	—
	c) Hard drive cage screws, 6-32 × 0.125-in, T-15 Torx, (2)	242966-006	—	—
	d) Front bezel screws, T-15, flat-head (2)	228213-003	—	—
	e) Expansion slot cover, short	394041-001	—	—
	f) Thumbscrew, molded cap	179333-003	—	—
	g) Thumbscrew assembly, right-attach	405895-002	—	—
	h) Thumbscrew assembly, left-attach	405895-001	—	—
12	Misc. rubber grommet isolation kit*	—	430370-001	Mandatory[1]
13	Plastics kit*	—	407753-001	Mandatory[1]
	a) PPM retainer (2)	390534-001	—	—
	b) PCI retainer, low profile (2)	397873-001	—	—
	c) Hard drive backplane retainer	397449-001	—	—
	d) T-10/T-15 Torx screwdriver holder	373134-001	—	—
	e) PCI card guide retainer	379046-002	—	—
	f) Power cord retainer clip	352993-001	—	—
14	Return kit, pack box, and cushions*	—	289545-001	Mandatory[1]
15	T-10/T-15 Torx screwdriver*	377511-001	413965-001	Mandatory[1]

*Not shown

[1]Mandatory—Parts for which customer self repair is mandatory. If you request HP to replace these parts, you will be charged for the travel and labor costs of this service.

[2]Optional—Parts for which customer self repair is optional. These parts are also designed for customer self repair. If, however, you require that HP replace them for you, there may or may not be additional charges, depending on the type of warranty service designated for your product.

[3]No—Some HP parts are not designed for customer self repair. In order to satisfy the customer warranty, HP requires that an authorized service provider replace the part. These parts are identified as "No" in the Illustrated Parts Catalog.

[1]Mandatory: Obligatoire—Pièces pour lesquelles la réparation par le client est obligatoire. Si vous demandez à HP de remplacer ces pièces, les coûts de déplacement et main d'œuvre du service vous seront facturés.
[2]Optional: Facultatif—Pièces pour lesquelles la réparation par le client est facultative. Ces pièces sont également conçues pour permettre au client d'effectuer lui-même la réparation. Toutefois, si vous demandez à HP de remplacer ces pièces, l'intervention peut ou non vous être facturée, selon le type de garantie applicable à votre produit.
[3]No: Non—Certaines pièces HP ne sont pas conçues pour permettre au client d'effectuer lui-même la réparation. Pour que la garantie puisse s'appliquer, HP exige que le remplacement de la pièce soit effectué par un Mainteneur Agréé. Ces pièces sont identifiées par la mention “Non” dans le Catalogue illustré.

[1]Mandatory: Obbligatorie—Parti che devono essere necessariamente riparate dal cliente. Se il cliente ne affida la riparazione ad HP, deve sostenere le spese di spedizione e di manodopera per il servizio.
[2]Optional: Opzionali—Parti la cui riparazione da parte del cliente è facoltativa. Si tratta comunque di componenti progettati per questo scopo. Se tuttavia il cliente ne richiede la sostituzione ad HP, potrebbe dover sostenere spese addizionali a seconda del tipo di garanzia previsto per il prodotto.
[3]No: Non CSR—Alcuni componenti HP non sono progettati per la riparazione da parte del cliente. Per rispettare la garanzia, HP richiede che queste parti siano sostituite da un centro di assistenza autorizzato. Tali parti sono identificate da un “No” nel Catalogo illustrato dei componenti.

[1]Mandatory: Zwingend—Teile, die im Rahmen des Customer Self Repair Programms ersetzt werden müssen. Wenn Sie diese Teile von HP ersetzen lassen, werden Ihnen die Versand- und Arbeitskosten für diesen Service berechnet.
[2]Optional: Optional—Teile, für die das Customer Self Repair-Verfahren optional ist. Diese Teile sind auch für Customer Self Repair ausgelegt. Wenn Sie jedoch den Austausch dieser Teile von HP vornehmen lassen möchten, können bei diesem Service je nach den für Ihr Produkt vorgesehenen Garantiebedingungen zusätzliche Kosten anfallen.
[3]No: Kein—Einige Teile sind nicht für Customer Self Repair ausgelegt. Um den Garantieanspruch des Kunden zu erfüllen, muss das Teil von einem HP Servicepartner ersetzt werden. Im illustrierten Teilekatalog sind diese Teile mit „No“ bzw. „Nein“ gekennzeichnet.

[1]Mandatory: Obligatorio—componentes para los que la reparación por parte del usuario es obligatoria. Si solicita a HP que realice la sustitución de estos componentes, tendrá que hacerse cargo de los gastos de desplazamiento y de mano de obra de dicho servicio.
[2]Optional: Opcional— componentes para los que la reparación por parte del usuario es opcional. Estos componentes también están diseñados para que puedan ser reparados por el usuario. Sin embargo, si precisa que HP realice su sustitución, puede o no conllevar costes adicionales, dependiendo del tipo de servicio de garantía correspondiente al producto.
[3]No: No—Algunos componentes no están diseñados para que puedan ser reparados por el usuario. Para que el usuario haga valer su garantía, HP pone como condición que un proveedor de servicios autorizado realice la sustitución de estos componentes. Dichos componentes se identifican con la palabra “No” en el catálogo ilustrado de componentes.

[1]Mandatory: Verplicht—Onderdelen waarvoor Customer Self Repair verplicht is. Als u HP verzoekt deze onderdelen te vervangen, komen de reiskosten en het arbeidsloon voor uw rekening.
[2]Optional: Optioneel—Onderdelen waarvoor reparatie door de klant optioneel is. Ook deze onderdelen zijn ontworpen voor reparatie door de klant. Als u echter HP verzoekt deze onderdelen voor u te vervangen, kunnen daarvoor extra kosten in rekening worden gebracht, afhankelijk van het type garantieservice voor het product.
[3]No: Nee—Sommige HP onderdelen zijn niet ontwikkeld voor reparatie door de klant. In verband met de garantievoorwaarden moet het onderdeel door een geautoriseerde Service Partner worden vervangen. Deze onderdelen worden in de geïllustreerde onderdelencatalogus aangemerkt met "Nee".

[1]Mandatory: Obrigatória—Peças cujo reparo feito pelo cliente é obrigatório. Se desejar que a HP substitua essas peças, serão cobradas as despesas de transporte e mão-de-obra do serviço.
[2]Optional: Opcional—Peças cujo reparo feito pelo cliente é opcional. Essas peças também são projetadas para o reparo feito pelo cliente. No entanto, se desejar que a HP as substitua, pode haver ou não a cobrança de taxa adicional, dependendo do tipo de serviço de garantia destinado ao produto.

[3]No: Nenhuma—Algumas peças da HP não são projetadas para o reparo feito pelo cliente. A fim de cumprir a garantia do cliente, a HP exige que um técnico autorizado substitua a peça. Essas peças estão identificadas com a marca “No” (Não), no catálogo de peças ilustrado.

[1]Mandatory：必須 - 顧客自己修理が必須の部品。当該部品について、もしもお客様がHPに交換作業を依頼される場合には、その修理サービスに関する交通費および人件費がお客様に請求されます。

[2]Optional：任意 - 顧客自己修理が任意である部品。この部品も顧客自己修理用です。当該部品について、もしもお客様がHPに交換作業を依頼される場合には、お買い上げの製品に適用される保証サービス内容の範囲内においては、費用を負担していただくことなく保証サービスを受けることができます。

[3]No：除外 - HP製品の一部の部品は、顧客自己修理用ではありません。製品の保証を継続するためには、HPまたはHP正規保守代理店による交換作業が必須となります。部品カタログには、当該部品が顧客自己修理除外品である旨が記載されています。

[1]Mandatory: 强制性的 — 要求客户必须自行维修的部件。如果您请求 HP 更换这些部件，则必须为该服务支付差旅费和人工费用。

[2]Optional: 可选的 — 客户可以选择是否自行维修的部件。这些部件也是为客户自行维修设计的。不过，如果您要求 HP 为您更换这些部件，则根据为您的产品指定的保修服务类型，HP 可能收取或不再收取任何附加费用。

[3]No: 否 — 某些 HP 部件的设计并未考虑客户自行维修。为了满足客户保修的需要，HP 要求授权服务提供商更换相关部件。这些部件在部件图解目录中标记为“否”。

[1]Mandatory: 強制的 — 客戶自行維修所使用的零件是強制性的。如果您要求 HP 更換這些零件，HP 將會向您收取此服務所需的外出費用與勞動成本。

[2]Optional: 選購的 — 客戶自行維修所使用的零件是選購的。這些零件也設計用於客戶自行維修之用。不過，如果您要求 HP 為您更換，則可能需要也可能不需要負擔額外的費用，端視針對此產品指定的保固服務類型而定。

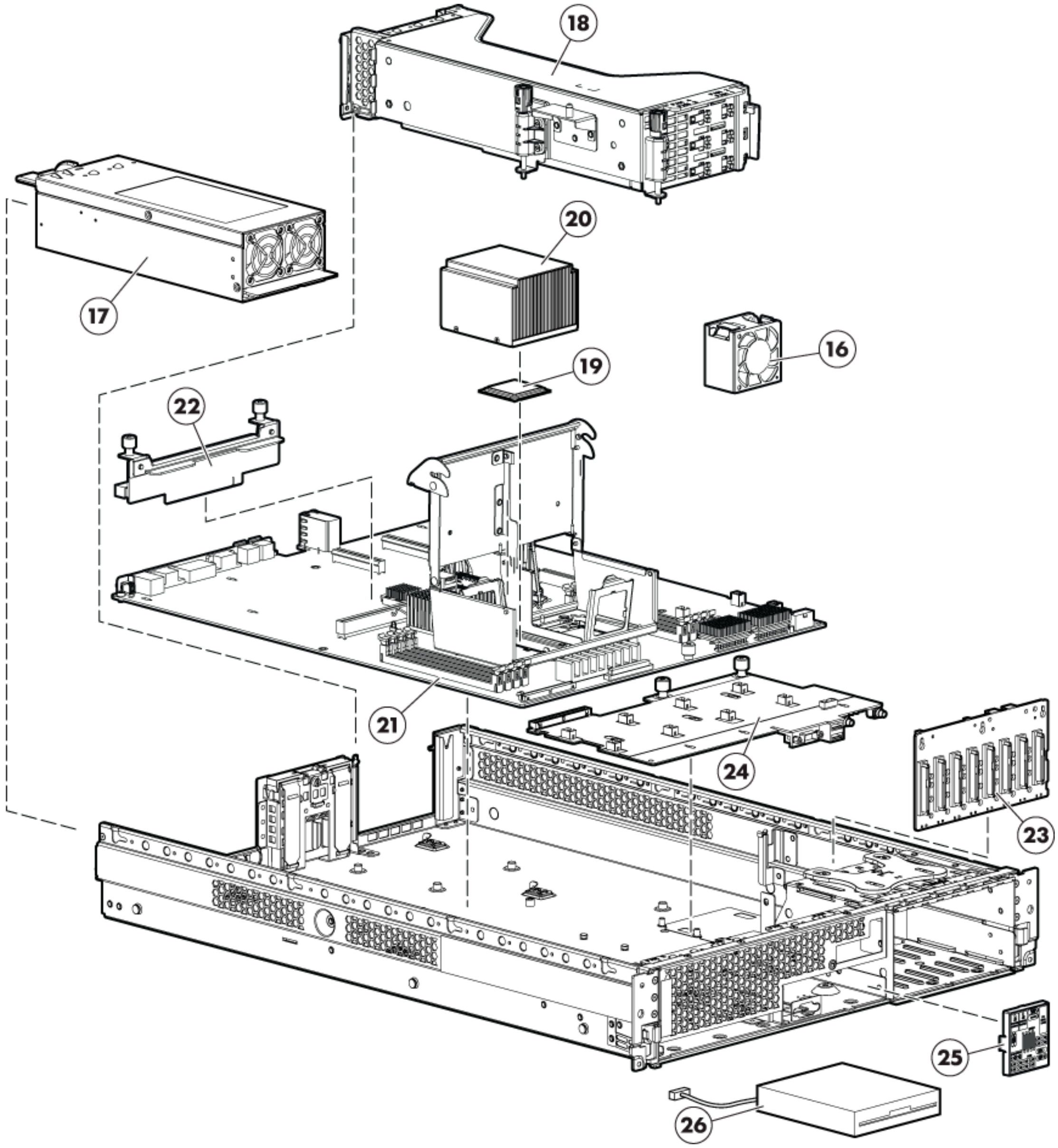
[3]No: 否 — 某些 HP 零件沒有消費者可自行維修的設計。為符合客戶保固，HP 需要授權的服務供應商更換零件。這些零件在圖示的零件目錄中，被標示為「否」。

[1] Mandatory: 필수 — 고객 셀프 수리가 의무 사항인 필수 부품. 사용자가 HP에 이 부품의 교체를 요청할 경우 이 서비스에 대한 출장비 및 작업비가 청구됩니다.

[2] Optional: 옵션 — 고객 셀프 수리가 선택 사항인 부품. 이 부품들도 고객 셀프 수리가 가능하도록 설계되었습니다. 하지만 사용자가 HP에 이 부품의 교체를 요청할 경우 사용자가 구입한 제품에 해당하는 보증 서비스 유형에 따라 추가 비용 없이 교체가 가능할 수 있습니다.

[3] No: No — 고객 셀프 수리가 불가능하도록 설계된 HP 부품. 이 부품들은 고객 셀프 수리가 불가능하도록 설계되었습니다. HP는 고객 보증을 만족시키기 위해 공인 서비스 제공업체를 통해 부품을 교체하도록 하고 있습니다.

System components



Item	Description	Assembly part number	Spare part number	Customer self repair (on page 6)
	System components			
16	Hot-plug fan, 60-mm	394035-001	407747-001	Mandatory[1]
17	Hot-plug power supply, 1000-W	380622-001	403781-001	Mandatory[1]
18	PCI riser cage	—	—	—
	a) PCI riser cage, with non-hot-plug PCIe (standard)	412878-001	408786-001	Optional[2]

Item	Description	Assembly part number	Spare part number	Customer self repair (on page 6)
	b) PCI riser cage, with non-hot-plug PCI-X/PCIe (optional)*	412878-002	408788-001	Optional[2]
	c) PCI riser cage, with non-hot-plug PCIe, 225W (optional)*	012757-002	464585-001	Optional[2]
19	Processor	—	—	—
	a) 1.8-GHz, dual-core AMD Opteron™ Model 2210 HE, 68-W **	410714-004	434949-001	Optional[2]
	b) 1.8-GHz, dual-core AMD Opteron™ Model 2210, 95-W* **	410713-005	419473-001	Optional[2]
	c) 2.0-GHz, dual-core AMD Opteron™ Model 2212 HE, 68-W* **	410714-003	419475-001	Optional[2]
	d) 2.2-GHz, dual-core AMD Opteron™ Model 2214 HE, 68-W* **	410714-002	419477-001	Optional[2]
	e) 2.4-GHz, dual-core AMD Opteron™ Model 2216 HE, 68-W* **	410714-001	419479-001	Optional[2]
	f) 2.4-GHz, dual-core AMD Opteron™ Model 2216, 95-W* **	410713-002	419478-001	Optional[2]
	g) 2.6-GHz, dual-core AMD Opteron™ Model 2218, 95-W* **	410713-001	419480-001	Optional[2]
	h) 3.0-GHz, dual-core AMD Opteron™ Model 2222, 95-W* **	410713-007	451810-001	Optional[2]
20	Processor heatsink, thermal grease, and alcohol pad	391137-001	408790-001	Optional[2]
	Boards			
21	System board with backplate and battery	446771-001	449365-001	Optional[2]
22	Power supply backplane	399428-001	407750-001	Optional[2]
23	8-bay hard drive backplane	012531-001	407751-001	Mandatory[1]
24	Fan board	012525-001	408791-001	Optional[2]
25	Systems Insight Display with cover	406566-001	430448-001	Mandatory[1]
	Media drives			
26	USB diskette drive (optional)	263394-002	399396-001	Mandatory[1]
27	CD-ROM drive, removable slimline (optional)*	222837-003	399401-001	Mandatory[1]
28	DVD-ROM drive, removable slimline, 8X/24X (optional) *	395910-001	397928-001	Mandatory[1]
29	CD-RW/DVD-ROM drive, slimline, 24X (optional)*	383696-002	399959-001	Mandatory[1]
30	DVD+R/RW drive, slimline, 8X*	395911-001	399402-001	Mandatory[1]
	Memory			
31	DIMMs	—	—	—
	a) 512-MB, registered PC2-5300, single-rank DIMM*	405474-051	430449-001	Mandatory[1]

Item	Description	Assembly part number	Spare part number	Customer self repair (on page 6)
	b) 1-GB, registered PC2-5300, single-rank DIMM*	405475-051	430450-001	Mandatory[1]
	c) 2-GB, registered PC2-5300, dual-rank DIMM*	405476-051	432668-001	Mandatory[1]
	d) 4-GB, registered PC2-5300, dual-rank DIMM*	405477-061	432670-001	Mandatory[1]
	e) 8-GB, registered PC2-5300, dual-rank DIMM*	405478-071	432671-001	Mandatory[1]
	Cables			
32	Miscellaneous cable kit*	—	408795-001	Mandatory[1]
	a) Power cable, 10-pin	394038-001	—	—
	b) Systems Insight Display cable	219049-003	—	—
33	SAS cable*	361316-010	408796-001	Mandatory[1]
34	Data cable kit*	—	408797-001	Mandatory[1]
	a) Fan board cable*	372616-002	—	—
	b) Media drive multibay cable*	356452-003	—	—
35	AC power cord*	142263-001	142258-001	Mandatory[1]
	Rack mounting hardware			
36	Rack mounting hardware kit*	360322-503	359254-001	Mandatory[1]
	Miscellaneous			
37	Media drive ejector assembly*	394022-002	409007-001	Optional[2]
38	Battery, 3.3-V, lithium*	166899-001	153099-001	Mandatory[1]
	Options			
39	SAS hot-plug hard drive*	—	—	—
	a) 36-GB, 10,000-rpm, 2.5-in	375859-B21	376596-001	Mandatory[1]
	b) 72-GB, 10,000-rpm, 2.5-in	375861-B21	376597-001	Mandatory[1]
40	60-GB SFF SATA hard drive, 5,400-rpm, 1 yr warranty*	379306-B21	382264-001	Mandatory[1]
41	Smart Array E200 Controller*	012891-001	412799-001	Optional[2]
42	Smart Array E200 Controller cache module, 64-MB*	012970-001	412800-001	Optional[2]
43	Smart Array E200 Controller cache module, 128-MB*	409248-001	413486-001	Optional[2]
44	Smart Array P400 Controller*	012760-001	405831-001	Optional[2]
45	Smart Array P400 Controller cache module, 256-MB*	012764-004	405836-001	Optional[2]
46	Smart Array P400 Controller cache module, 512-MB*	012764-003	405835-001	Optional[2]
47	Smart Array P400 Controller battery*	381573-001	398648-001	Optional[2]

Item	Description	Assembly part number	Spare part number	Customer self repair (on page 6)
48	Smart Array P400 Controller battery cable assembly, 11.5-in*	408658-001	409124-001	Optional[2]
49	Smart Array P400 Controller battery cable assembly, 24-in*	408658-002	409125-001	Optional[2]
50	NVIDIA Quadro FX5600 GPU card*	455676-001	456139-001	Optional[2]

*Not shown
**All processors in this HP ProLiant server must have the same cache size, speed, number of cores, and rated maximum power consumption.
[1]Mandatory—Parts for which customer self repair is mandatory. If you request HP to replace these parts, you will be charged for the travel and labor costs of this service.
[2]Optional—Parts for which customer self repair is optional. These parts are also designed for customer self repair. If, however, you require that HP replace them for you, there may or may not be additional charges, depending on the type of warranty service designated for your product.
[3]No—Some HP parts are not designed for customer self repair. In order to satisfy the customer warranty, HP requires that an authorized service provider replace the part. These parts are identified as "No" in the Illustrated Parts Catalog.

[1]Mandatory: Obligatoire—Pièces pour lesquelles la réparation par le client est obligatoire. Si vous demandez à HP de remplacer ces pièces, les coûts de déplacement et main d'œuvre du service vous seront facturés.
[2]Optional: Facultatif—Pièces pour lesquelles la réparation par le client est facultative. Ces pièces sont également conçues pour permettre au client d'effectuer lui-même la réparation. Toutefois, si vous demandez à HP de remplacer ces pièces, l'intervention peut ou non vous être facturée, selon le type de garantie applicable à votre produit.
[3]No: Non—Certaines pièces HP ne sont pas conçues pour permettre au client d'effectuer lui-même la réparation. Pour que la garantie puisse s'appliquer, HP exige que le remplacement de la pièce soit effectué par un Mainteneur Agréé. Ces pièces sont identifiées par la mention “Non” dans le Catalogue illustré.

[1]Mandatory: Obbligatorie—Parti che devono essere necessariamente riparate dal cliente. Se il cliente ne affida la riparazione ad HP, deve sostenere le spese di spedizione e di manodopera per il servizio.
[2]Optional: Opzionali—Parti la cui riparazione da parte del cliente è facoltativa. Si tratta comunque di componenti progettati per questo scopo. Se tuttavia il cliente ne richiede la sostituzione ad HP, potrebbe dover sostenere spese addizionali a seconda del tipo di garanzia previsto per il prodotto.
[3]No: Non CSR—Alcuni componenti HP non sono progettati per la riparazione da parte del cliente. Per rispettare la garanzia, HP richiede che queste parti siano sostituite da un centro di assistenza autorizzato. Tali parti sono identificate da un “No” nel Catalogo illustrato dei componenti.

[1]Mandatory: Zwingend—Teile, die im Rahmen des Customer Self Repair Programms ersetzt werden müssen. Wenn Sie diese Teile von HP ersetzen lassen, werden Ihnen die Versand- und Arbeitskosten für diesen Service berechnet.
[2]Optional: Optional—Teile, für die das Customer Self Repair-Verfahren optional ist. Diese Teile sind auch für Customer Self Repair ausgelegt. Wenn Sie jedoch den Austausch dieser Teile von HP vornehmen lassen möchten, können bei diesem Service je nach den für Ihr Produkt vorgesehenen Garantiebedingungen zusätzliche Kosten anfallen.
[3]No: Kein—Einige Teile sind nicht für Customer Self Repair ausgelegt. Um den Garantieanspruch des Kunden zu erfüllen, muss das Teil von einem HP Servicepartner ersetzt werden. Im illustrierten Teilekatalog sind diese Teile mit „No“ bzw. „Nein“ gekennzeichnet.

[1]Mandatory: Obligatorio—componentes para los que la reparación por parte del usuario es obligatoria. Si solicita a HP que realice la sustitución de estos componentes, tendrá que hacerse cargo de los gastos de desplazamiento y de mano de obra de dicho servicio.
[2]Optional: Opcional— componentes para los que la reparación por parte del usuario es opcional. Estos componentes también están diseñados para que puedan ser reparados por el usuario. Sin embargo, si precisa que

HP realice su sustitución, puede o no conllevar costes adicionales, dependiendo del tipo de servicio de garantía correspondiente al producto.
[3]No: No—Algunos componentes no están diseñados para que puedan ser reparados por el usuario. Para que el usuario haga valer su garantía, HP pone como condición que un proveedor de servicios autorizado realice la sustitución de estos componentes. Dichos componentes se identifican con la palabra "No" en el catálogo ilustrado de componentes.

[1]Mandatory: Verplicht—Onderdelen waarvoor Customer Self Repair verplicht is. Als u HP verzoekt deze onderdelen te vervangen, komen de reiskosten en het arbeidsloon voor uw rekening.
[2]Optional: Optioneel—Onderdelen waarvoor reparatie door de klant optioneel is. Ook deze onderdelen zijn ontworpen voor reparatie door de klant. Als u echter HP verzoekt deze onderdelen voor u te vervangen, kunnen daarvoor extra kosten in rekening worden gebracht, afhankelijk van het type garantieservice voor het product.
[3]No: Nee—Sommige HP onderdelen zijn niet ontwikkeld voor reparatie door de klant. In verband met de garantievoorwaarden moet het onderdeel door een geautoriseerde Service Partner worden vervangen. Deze onderdelen worden in de geïllustreerde onderdelencatalogus aangemerkt met "Nee".

[1]Mandatory: Obrigatória—Peças cujo reparo feito pelo cliente é obrigatório. Se desejar que a HP substitua essas peças, serão cobradas as despesas de transporte e mão-de-obra do serviço.
[2]Optional: Opcional—Peças cujo reparo feito pelo cliente é opcional. Essas peças também são projetadas para o reparo feito pelo cliente. No entanto, se desejar que a HP as substitua, pode haver ou não a cobrança de taxa adicional, dependendo do tipo de serviço de garantia destinado ao produto.
[3]No: Nenhuma—Algumas peças da HP não são projetadas para o reparo feito pelo cliente. A fim de cumprir a garantia do cliente, a HP exige que um técnico autorizado substitua a peça. Essas peças estão identificadas com a marca "No" (Não), no catálogo de peças ilustrado.

[1]Mandatory：必須 - 顧客自己修理が必須の部品。当該部品について、もしもお客様がHPに交換作業を依頼される場合には、その修理サービスに関する交通費および人件費がお客様に請求されます。

[2]Optional：任意 - 顧客自己修理が任意である部品。この部品も顧客自己修理用です。当該部品について、もしもお客様がHPに交換作業を依頼される場合には、お買い上げの製品に適用される保証サービス内容の範囲内においては、費用を負担していただくことなく保証サービスを受けることができます。

[3]No：除外 - HP製品の一部の部品は、顧客自己修理用ではありません。製品の保証を継続するためには、HPまたはHP正規保守代理店による交換作業が必須となります。部品カタログには、当該部品が顧客自己修理除外品である旨が記載されています。

[1]Mandatory: 强制性的 — 要求客户必须自行维修的部件。如果您请求 HP 更换这些部件，则必须为该服务支付差旅费和人工费用。

[2]Optional: 可选的 — 客户可以选择是否自行维修的部件。这些部件也是为客户自行维修设计的。不过，如果您要求 HP 为您更换这些部件，则根据为您的产品指定的保修服务类型，HP 可能收取或不再收取任何附加费用。

[3]No: 否 — 某些 HP 部件的设计并未考虑客户自行维修。为了满足客户保修的需要，HP 要求授权服务提供商更换相关部件。这些部件在部件图解目录中标记为“否”。

[1]Mandatory: 強制的 — 客戶自行維修所使用的零件是強制性的。如果您要求 HP 更換這些零件，HP 將會向您收取此服務所需的外出費用與勞動成本。

[2]Optional: 選購的 — 客戶自行維修所使用的零件是選購的。這些零件也設計用於客戶自行維修之用。不過，如果您要求 HP 為您更換，則可能需要也可能不需要負擔額外的費用，端視針對此產品指定的保固服務類型而定。

[3]No: 否 — 某些 HP 零件沒有消費者可自行維修的設計。為符合客戶保固，HP 需要授權的服務供應商更換零件。這些零件在圖示的零件目錄中，被標示為「否」。

[1] Mandatory: 필수 — 고객 셀프 수리가 의무 사항인 필수 부품. 사용자가 HP에 이 부품의 교체를 요청할 경우 이 서비스에 대한 출장비 및 작업비가 청구됩니다.

[2] Optional: 옵션 — 고객 셀프 수리가 선택 사항인 부품. 이 부품들도 고객 셀프 수리가 가능하도록 설계되었습니다. 하지만 사용자가 HP에 이 부품의 교체를 요청할 경우 사용자가 구입한 제품에 해당하는 보증 서비스 유형에 따라 추가 비용 없이 교체가 가능할 수 있습니다.

[3] No: No — 고객 셀프 수리가 불가능하도록 설계된 HP 부품. 이 부품들은 고객 셀프 수리가 불가능하도록 설계되었습니다. HP는 고객 보증을 만족시키기 위해 공인 서비스 제공업체를 통해 부품을 교체하도록 하고 있습니다.

Removal and replacement procedures

Required tools

You need the following items for some procedures:

- T-10/T-15 Torx screwdriver (provided inside the server)
- HP Insight Diagnostics software ("HP Insight Diagnostics" on page 83)

Safety considerations

Before performing service procedures, review all the safety information.

Preventing electrostatic discharge

To prevent damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Server warnings and cautions

Before installing a server, be sure that you understand the following warnings and cautions.

⚠ **WARNING:** To reduce the risk of electric shock or damage to the equipment:

- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
- Unplug the power cord from the power supply to disconnect power to the equipment.
- Do not route the power cord where it can be walked on or pinched by items placed against it. Pay particular attention to the plug, electrical outlet, and the point where the cord extends from the server.

⚠ **WARNING:** To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

△ **CAUTION:** Do not operate the server for long periods with the access panel open or removed. Operating the server in this manner results in improper airflow and improper cooling that can lead to thermal damage.

Preparation procedures

To access some components and perform certain service procedures, you must perform one or more of the following procedures:

- Extend the server from the rack (on page 27).

  If you are performing service procedures in an HP, Compaq branded, telco, or third-party rack cabinet, you can use the locking feature of the rack rails to support the server and gain access to internal components.

  For more information about telco rack solutions, refer to the RackSolutions.com website (http://www.racksolutions.com/hp).

- Power down the server (on page 28).

  If you must remove a server from a rack or a non-hot-plug component from a server, power down the server.

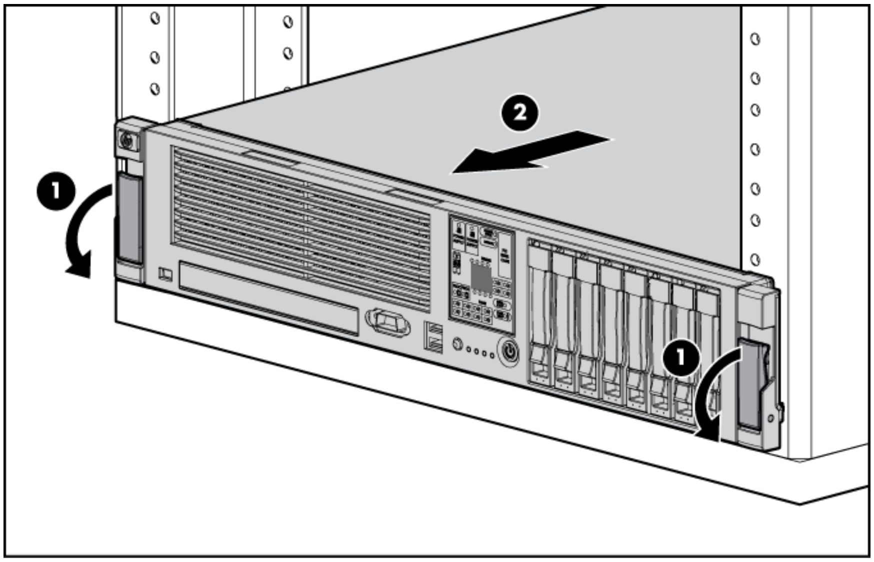
- Remove the server from the rack (on page 29).

  If the rack environment, cabling configuration, or the server location in the rack creates awkward conditions, remove the server from the rack.

Extend the server from the rack

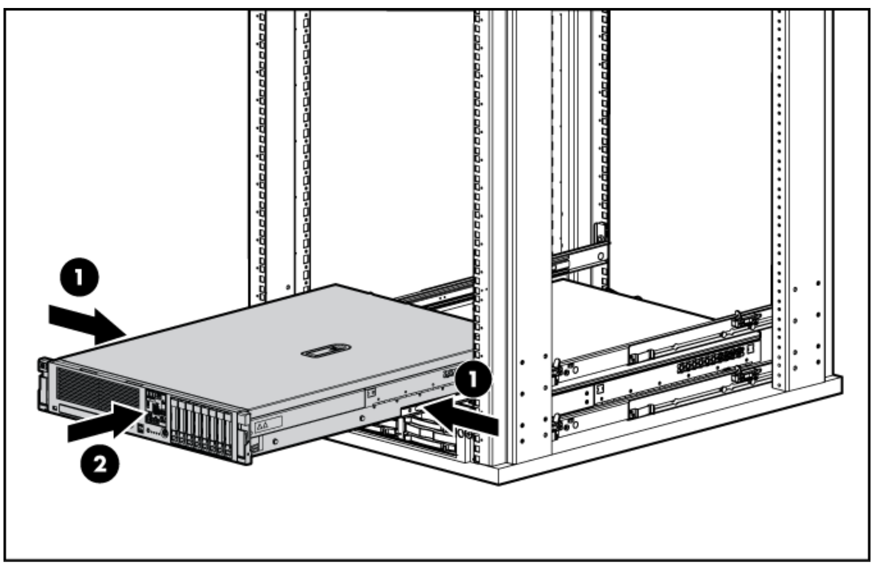
1. Pull down the quick release levers on each side of the server.
2. Extend the server until the server rail-release latches engage.

⚠ **WARNING:** To reduce the risk of personal injury or equipment damage, be sure that the rack is adequately stabilized before extending a component from the rack.



3. After performing the installation or maintenance procedure, slide the server back into the rack:
   a. Press the server rail-release latches and slide the server fully into rack.

> ⚠ **WARNING:** To reduce the risk of personal injury, be careful when pressing the server rail-release latches and sliding the server into the rack. The sliding rails could pinch your fingers.



   b. Slide the server fully into the rack.

Power down the server

> ⚠ **WARNING:** To reduce the risk of personal injury, electric shock, or damage to the equipment, remove the power cord to remove power from the server. The front panel Power On/Standby button does not completely shut off system power. Portions of the power supply and some internal circuitry remain active until AC power is removed.

> **IMPORTANT:** If installing a hot-plug device, it is not necessary to power down the server.

1. Back up the server data.
2. Shut down the operating system as directed by the operating system documentation.

   NOTE: If the operating system automatically places the server in Standby mode, omit the next step.

3. Press the Power On/Standby button to place the server in Standby mode. When the server activates Standby power mode, the system power LED changes to amber.

   IMPORTANT: Pressing the UID button illuminates the blue UID LEDs on the front and rear panels. In a rack environment, this feature facilitates locating a server when moving between the front and rear of the rack.

4. Disconnect the power cords.

The system is now without power.

Remove the server from the rack

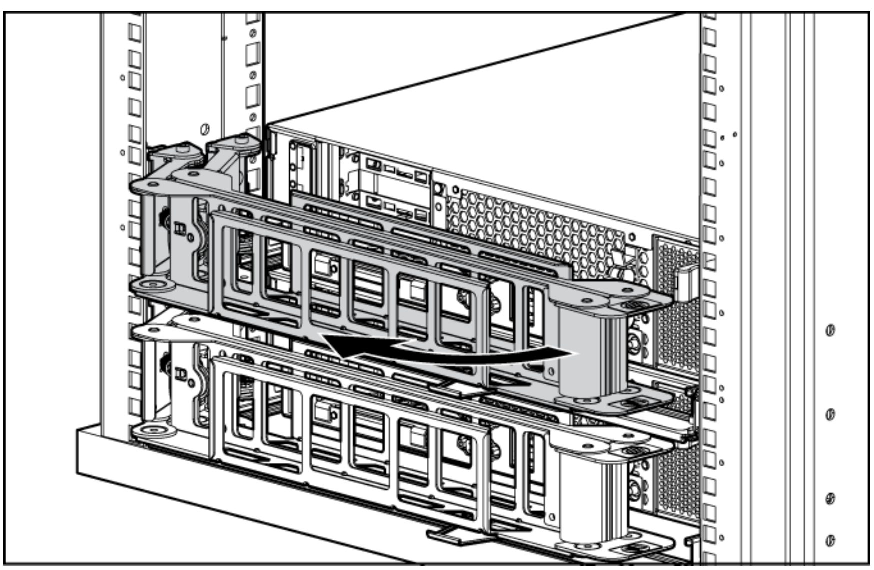
To remove the server from an HP, Compaq branded, telco, or third-party rack:

1. Power down the server (on page 28).
2. Extend the server from the rack (on page 27).
3. Disconnect the cabling and remove the server from the rack. For more information, refer to the documentation that ships with the rack mounting option.
4. Place the server on a sturdy, level surface.

Access the product rear panel

Cable management arm with left-hand swing

To access the server rear panel, open the cable management arm.

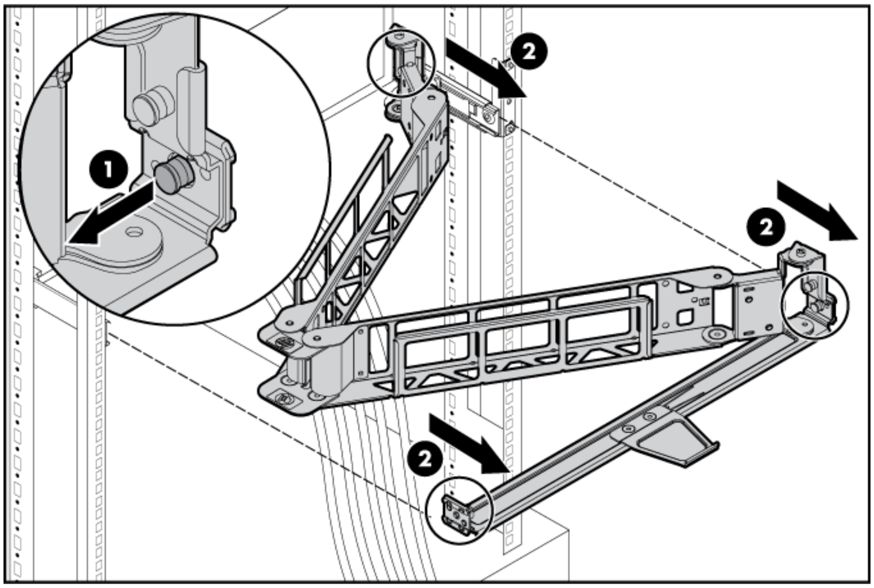


Cable management arm with right-hand swing

NOTE: To access some components, you may need to remove the cable management arm.

To access the product rear panel components, open the cable management arm:

1. Power down the server (on page 28).
2. Swing open the cable management arm.
3. Remove the cables from the cable trough.
4. Remove the cable management arm.



Access panel

⚠ **WARNING:** To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

△ **CAUTION:** Do not operate the server for long periods with the access panel open or removed. Operating the server in this manner results in improper airflow and improper cooling that can lead to thermal damage.

To remove the component:

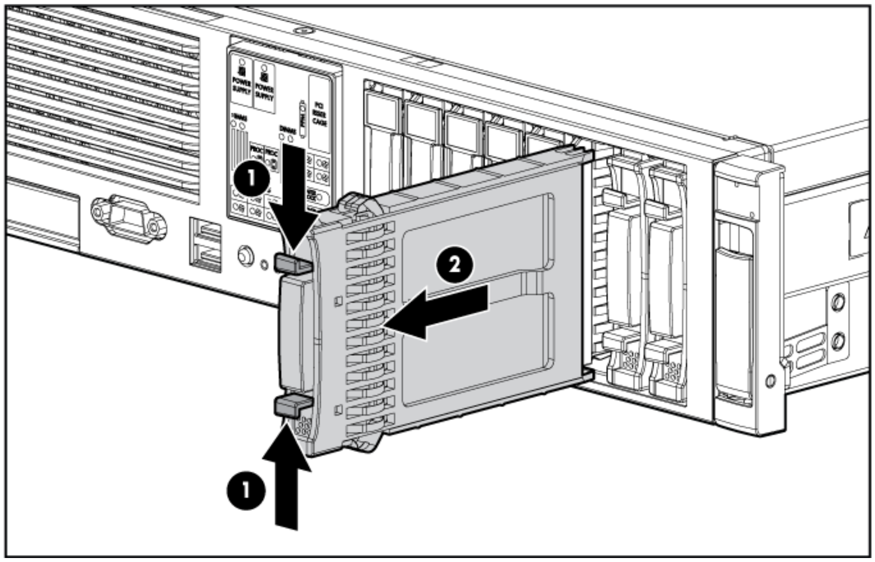
1. Power down the server if performing a non-hot-plug installation or maintenance procedure ("Power down the server" on page 28).
2. Extend the server from the rack (on page 27).
3. Use the T-15 Torx screwdriver attached to the rear of the server to loosen the security screw on the hood latch.
4. Lift up on the hood latch handle and remove the access panel.

To replace the component, reverse the removal procedure.

SAS hard drive blank

CAUTION: To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

Remove the component as indicated.



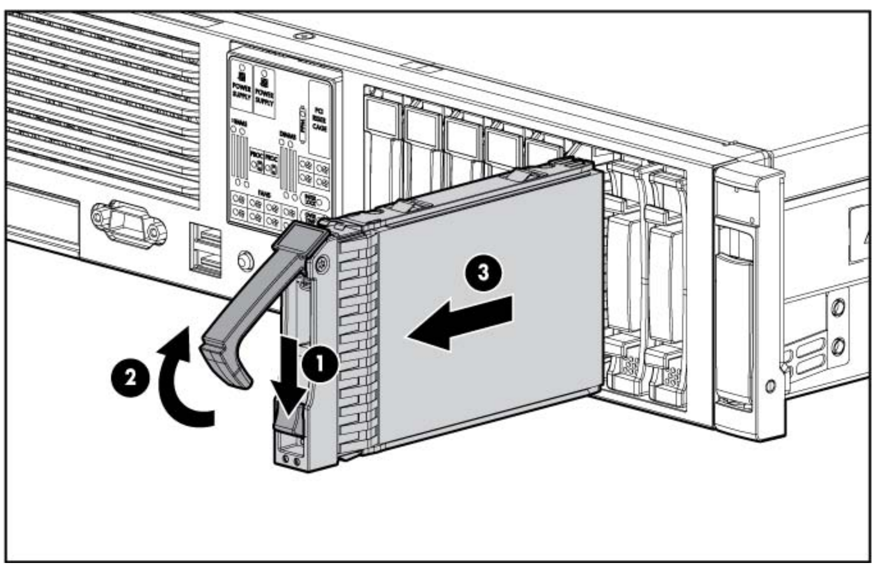
To replace the blank, slide the blank into the bay until it locks into place.

Hot-plug SAS hard drive

To remove the component:

CAUTION: To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

1. Determine the status of the hard drive from the hot-plug SAS hard drive LED combinations ("SAS and SATA hard drive LED combinations" on page 95).
2. Back up all server data on the hard drive.
3. Remove the hard drive.



To replace the component, reverse the removal procedure.

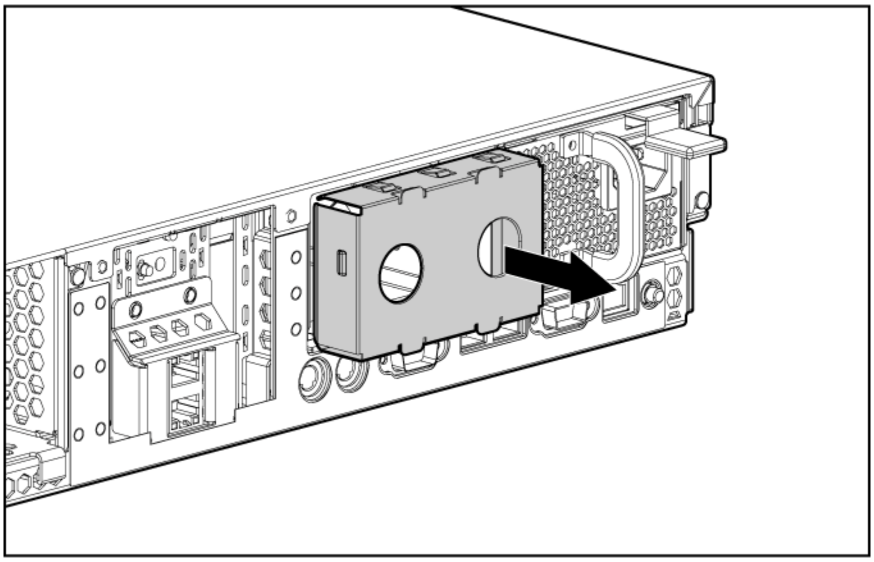
Power supply blank

To remove the component:

> **CAUTION:** To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

1. Access the product rear panel (on page 29).
2. Remove the power supply blank.

> **WARNING:** To reduce the risk of personal injury from hot surfaces, allow the power supply or power supply blank to cool before touching it.



To replace the component, reverse the removal procedure.

Hot-plug power supply

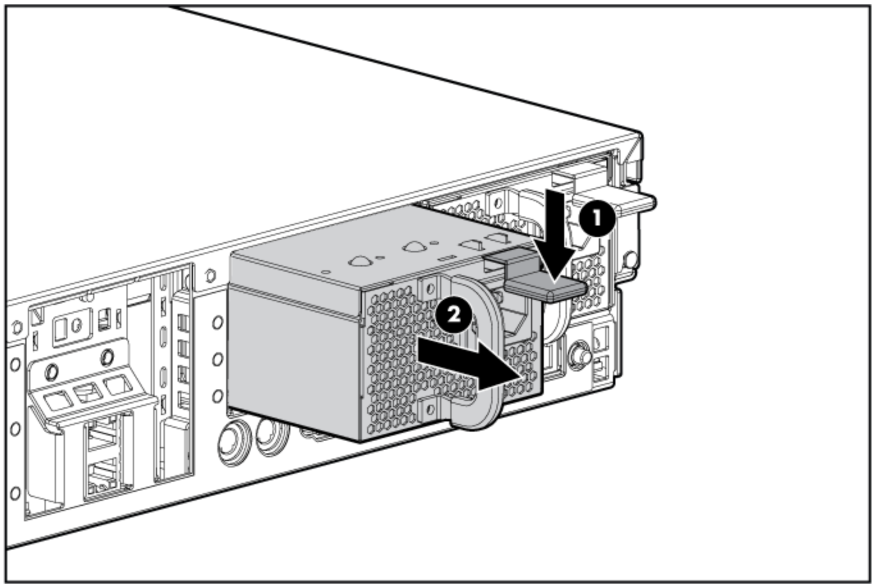
> **WARNING:** To reduce the risk of personal injury from hot surfaces, allow the power supply or power supply blank to cool before touching it.

> **CAUTION:** To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

To remove the component:

1. Determine how many hot-plug power supplies are installed:
   - If only one hot-plug power supply is installed, power down and remove the power cord from the server ("Power down the server" on page 28).
   - If more than one hot-plug power supply is installed, continue with the next step.
2. Access the product rear panel (on page 29).

3. Remove the hot-plug power supply.



⚠ **WARNING:** To reduce the risk of electric shock or damage to the equipment, do not connect the power cord to the power supply until the power supply is installed.

To replace the component:

1. Slide the hot-plug power supply into the power supply bay.
2. Connect the power cord to the power supply.
3. Install the cable management arm, if removed ("Access the product rear panel" on page 29).
4. Route the power cord through the cable management arm or power cord anchor.

   NOTE: If using the power cord anchor, be sure to leave enough slack in the power cord so that the redundant power supply can be removed without disconnecting the power cord from the primary power supply.

5. Close the cable management arm.
6. Connect the power cord to the power source.
7. Be sure that the power supply LED is green ("Rear panel LEDs and buttons" on page 88).
8. Be sure that the front panel external health LED is green ("Front panel LEDs and buttons" on page 86).

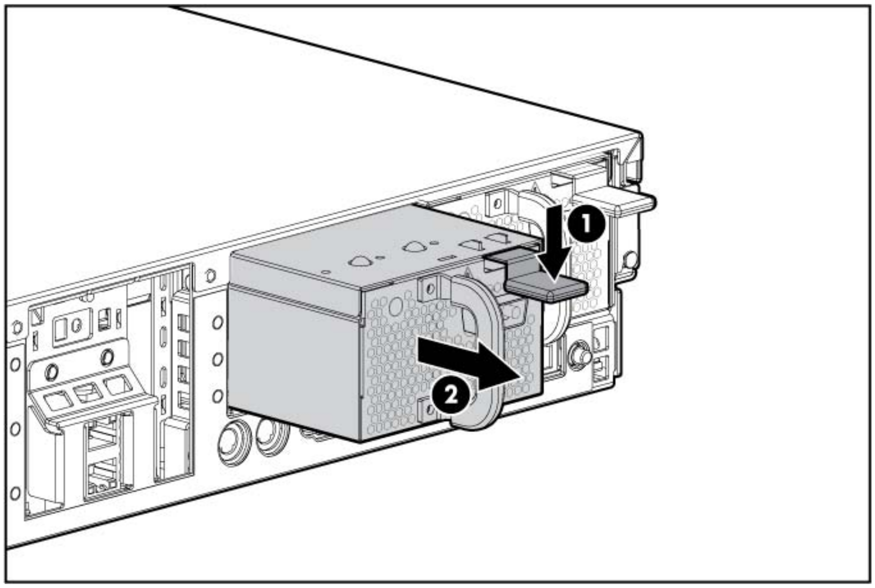
DC power supply

To remove the component:

⚠ **WARNING:** To reduce the risk of personal injury, remove all power from the DC source before disconnecting the power cord.

1. Identify the failed power supply.
2. Disconnect the power cord from the PDU.
3. Remove the power cord from the retaining clip.

4. Loosen the two thumbscrews on either side of the power cord.
5. Disconnect the power cord from the power supply.
6. Remove the power supply.



⚠ **WARNING:** To reduce the risk of electric shock, fire, and damage to the equipment, this product must be installed in accordance with the following guidelines:

- This power supply is intended only for installation in HP servers located in a restricted access location.
- This power supply is not intended for direct connection to the DC supply branch circuit. It should only be connected to a power distribution unit (PDU) that provides an independent overcurrent-protected output for each DC power supply. Each output overcurrent-protected device in the PDU must be suitable for interrupting fault current available from the DC power source and must be rated no more than 50A.
- This power supply is designed to be connected only to a DC power source that can be classified as SELV or TNV, in accordance with applicable national requirements for Information Technology Equipment and Telecommunications Equipment. Generally, these requirements are based on the International Standard for Information Technology Equipment, IEC 60950, and/or the European Telecommunication Standard ETS 300 132-2. The DC source is to have one pole (Neutral/Return) reliably connected to earth ground in accordance with local/regional electric codes and/or regulations.
- The green/yellow lead of the power cable assembly must be connected to a suitable ground/earth terminal. This terminal must be connected to a suitable building ground/earth terminal in accordance with local/regional electric codes/regulations. Do not rely on the rack or cabinet chassis to provide adequate ground/earth continuity.

⚠ **WARNING:** To reduce the risk of personal injury or damage to the equipment, the installation of power supplies should be performed only by individuals who are qualified in servicing server equipment and trained to deal with products capable of producing hazardous energy levels.

⚠ **WARNING:** To reduce the risk of personal injury from hot surfaces, observe the thermal labels on each power supply or module.

WARNING: To reduce the risk of injury from electric shock hazards, do not open power supplies. Refer all maintenance, upgrades, and servicing to qualified personnel.

CAUTION: Do not run the server with one AC power supply and one DC power supply installed.

CAUTION: Electrostatic discharge (ESD) can damage electronic components. Be sure that you are properly grounded (earthed) before beginning any installation procedure.

To replace the component:

WARNING: To reduce the risk of electric shock or damage to the equipment, do not connect the power cord to the power supply until the power supply is installed.

1. Slide the power supply into the power supply bay until the release/lock lever clicks, securing the power supply.
2. Connect the power cord to the power supply.
3. Tighten the two retaining screws on either side of the power cord connector.
4. Route the power cord:
   - If the cable management arm has a left-hand swing, route the power cord through the cable management arm.
   - If the cable management arm has a right-hand swing, remove the cable management arm or convert it for left-hand swing. For removal instructions, see "Cable management arm with right-hand swing (on page 29)." For conversion instructions, see the instructions that ship with the 2U Quick Deploy Rail System.
5. Connect the power cord to the PDU.
6. Be sure that the power supply LED is green ("Rear panel LEDs and buttons" on page 88).
7. Be sure that the front panel external health LED is green ("Front panel LEDs and buttons" on page 86).

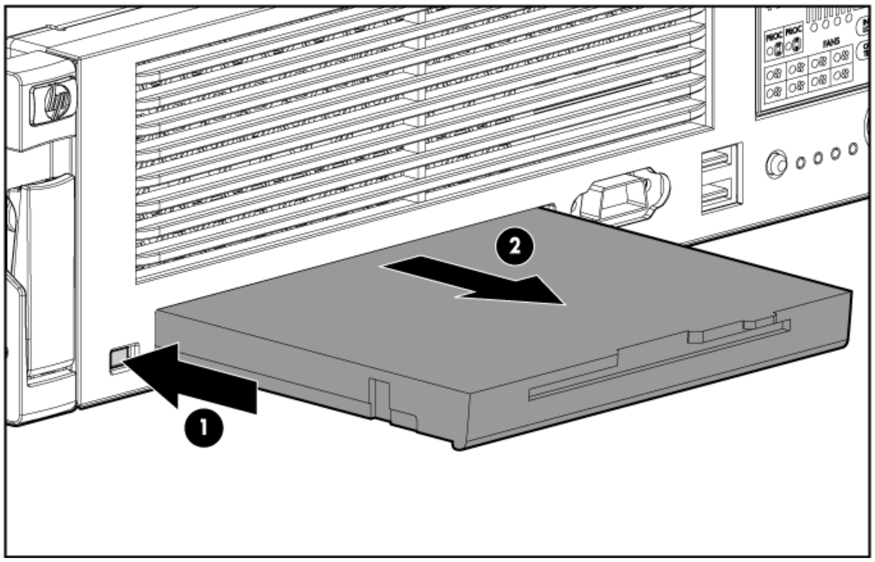
Media drive or blank

To remove the component:

CAUTION: To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

1. Power down the server (on page 28).

2. Remove the component as indicated:



To replace the component, slide the component into the bay until it is fully seated.

Hot-plug fan

The server supports variable fan speeds. The fans operate at minimum speed until a temperature change requires a fan speed increase to cool the server.

The server shuts down in the following temperature-related scenarios:

- At POST:
  - The BIOS suspends the server for 5 minutes if it detects a cautionary temperature level. If the cautionary temperature level is still detected after 5 minutes, the BIOS performs an orderly shutdown and enters Standby mode.
  - The BIOS performs an orderly shutdown if two or more fans have failed.
  - The server performs an immediate shutdown if it detects a critical temperature level.

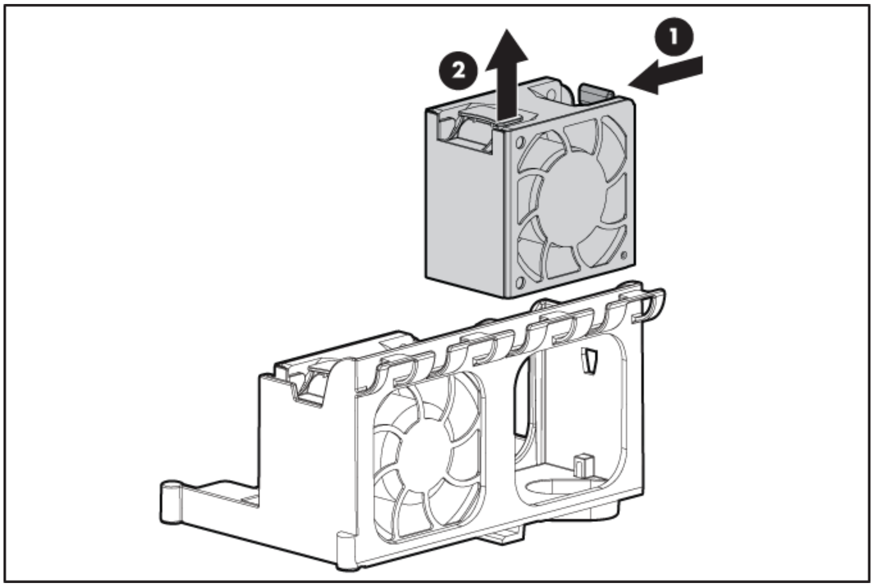
  IMPORTANT: An immediate shutdown is a hardware-controlled function and it overrides any firmware or software actions.

- In the operating system:
  - The Health Driver performs an orderly shutdown if it detects a cautionary temperature level. If the server detects a critical temperature level before the orderly shutdown occurs, the server performs an immediate shutdown. Additionally, the Health Driver performs an orderly shutdown if more than one fan is failed or removed.
  - When Thermal Shutdown is disabled in RBSU, the server performs an immediate shutdown if it detects a critical temperature level.

  IMPORTANT: An immediate shutdown is a hardware-controlled function and it overrides any firmware or software actions.

To remove the component:

1. Extend or remove the server from the rack ("Extend the server from the rack" on page 27, "Remove the server from the rack" on page 29).
2. Remove the access panel ("Access panel" on page 30).
3. Remove the fan.



CAUTION: Do not operate the server for long periods with the access panel open or removed. Operating the server in this manner results in improper airflow and improper cooling that can lead to thermal damage.

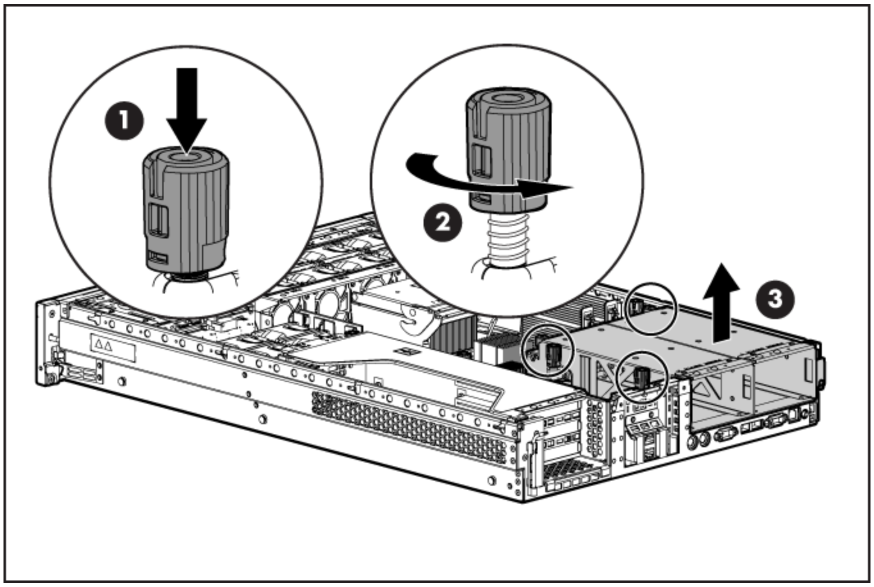
To replace the component, reverse the removal procedure.

Power supply cage assembly

To remove the component:

1. Power down the server (on page 28).
2. Access the product rear panel (on page 29).
3. Remove all power supplies ("Hot-plug power supply" on page 32).
4. Remove the server from the rack (on page 29).
5. Remove the access panel ("Access panel" on page 30).

6. Remove the power supply cage assembly.



To replace the component, reverse the removal procedure.

Battery-backed write cache procedures

Two types of procedures are provided for the BBWC option:

- Removal and replacement of failed components:
  - Removing the cache module (on page 38)
  - Removing the battery pack (on page 39)
- Recovery of cached data from a failed server ("Recovering data from the battery-backed write cache" on page 40)

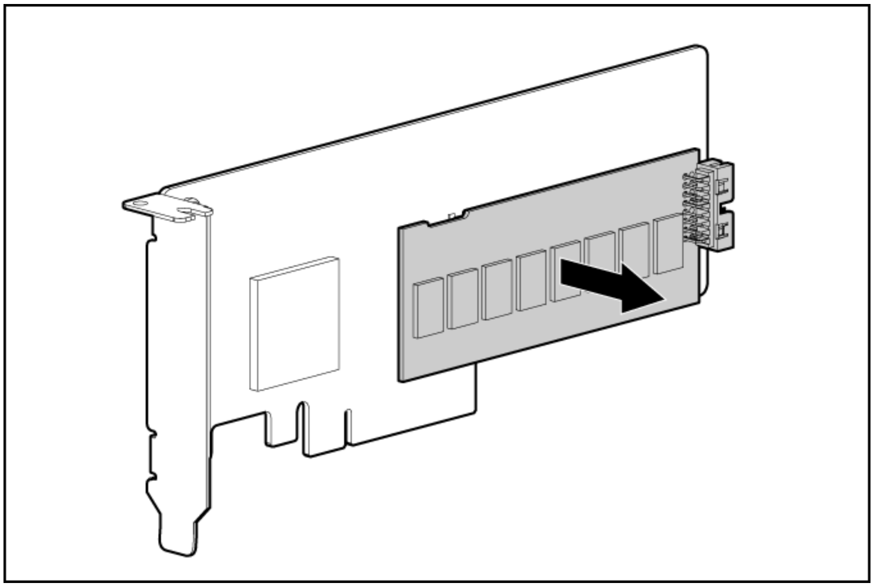
CAUTION: Do not detach the cable that connects the battery pack to the cache module. Detaching the cable causes any unsaved data in the cache module to be lost.

Removing the cache module

To remove the component:

1. Power down the server (on page 28).
2. Extend or remove the server from the rack ("Extend the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Access panel" on page 30).
4. Remove the controller ("Expansion board (slots 1 and 2)" on page 63).

5. Remove the cache module.



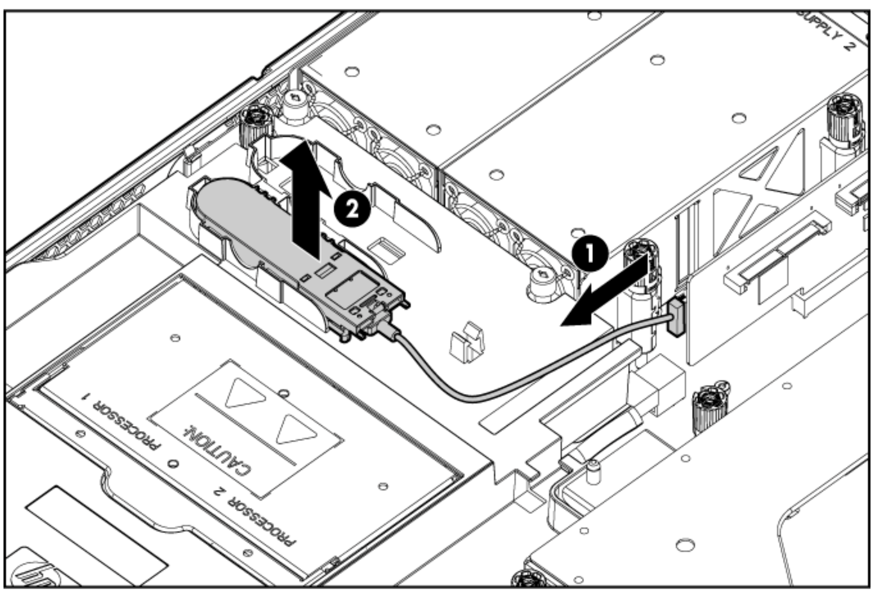
To replace the component, reverse the removal procedure.

△ **CAUTION:** To prevent damage to the cache module during installation, be sure the cache module is fully inserted before pressing down.

Removing the battery pack

To remove the component:

1. Power down the server (on page 28).
2. Extend or remove the server from the rack ("Extend the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Access panel" on page 30).
4. Disconnect the cable, and then remove the battery pack.



To replace the component, reverse the removal procedure.

Recovering data from the battery-backed write cache

If the server fails, use the following procedure to recover data temporarily stored in the BBWC.

> **CAUTION:** Before starting this procedure, read the information about protecting against electrostatic discharge ("Preventing electrostatic discharge" on page 26).

1. Perform one of the following:
   - Set up a recovery server station using an identical server model. Do not install any internal drives or BBWC in this server. (HP recommends this option.)
   - Find a server that has enough empty drive bays to accommodate all the drives from the failed server and that meets all the other requirements for drive and array migration.
2. Power down the failed server ("Power down the server" on page 28). If any data is stored in the cache module, a green LED on the module flashes every 2 seconds.

> **CAUTION:** Do not detach the cable that connects the battery pack to the cache module. Detaching the cable causes any unsaved data in the cache module to be lost.

3. Transfer the hard drives from the failed server to the recovery server station.
4. Perform one of the following:
   - If the array controller has failed, remove the cache module ("Removing the cache module" on page 38) and battery pack ("Removing the battery pack" on page 39) from the failed array controller, and install the cache module and battery pack on an array controller in the recovery server.
   - If the server has failed, remove the controller ("Expansion board (slots 1 and 2)" on page 63), cache module ("Removing the cache module" on page 38), and battery pack ("Removing the battery pack" on page 39) from the failed server, and install the controller, cache module, and battery pack in the recovery server.
5. Power up the recovery server. A 1759 POST message is displayed, stating that valid data was flushed from the cache. This data is now stored on the drives in the recovery server. You can now transfer the drives (and controller, if one was used) to another server.

Air baffle

Depending on the fan configuration, the air baffle is different. Use the following procedure for either configuration.

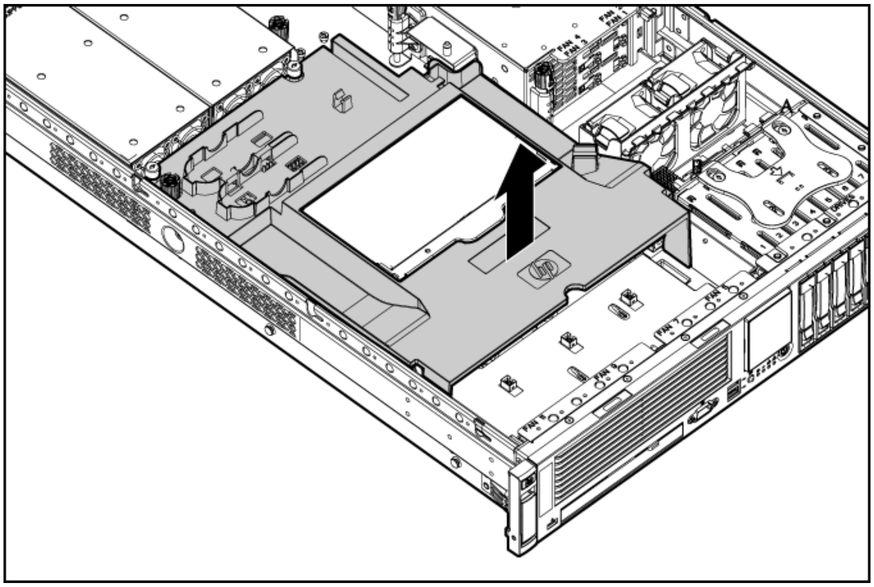
To remove the component:

> **IMPORTANT:** To maintain proper airflow and prevent thermal damage, always install the air baffle.

1. Power down the server (on page 28).
2. Extend or remove the server from the rack ("Extend the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Access panel" on page 30).

CAUTION: Do not detach the cable that connects the battery pack to the cache module. Detaching the cable causes any unsaved data in the cache module to be lost.

4. Remove the battery pack from the air baffle ("Removing the battery pack" on page 39).
5. Remove the air baffle.



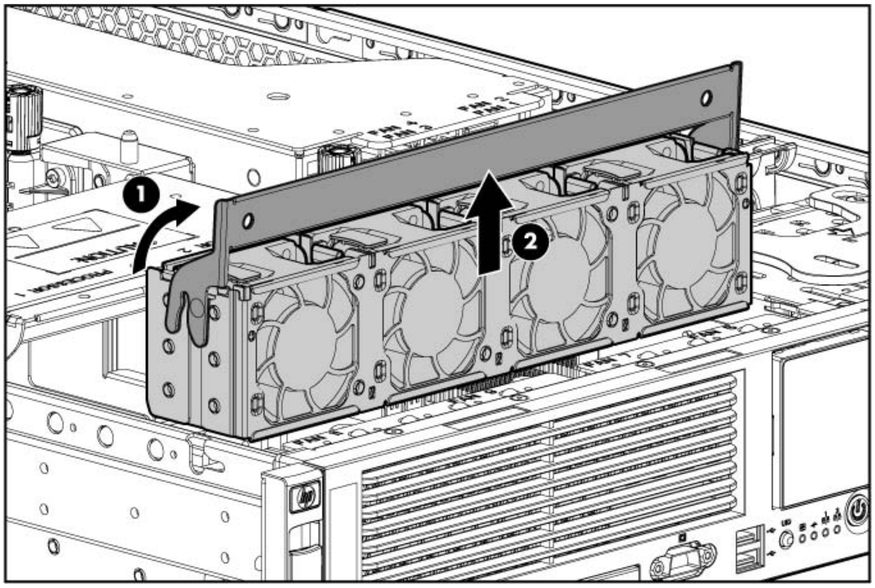
To replace the component, reverse the removal procedure.

Processor fan bracket

To remove the component:

1. Power down the server (on page 28).
2. Extend or remove the server from the rack ("Extend the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Access panel" on page 30).
4. Remove the air baffle ("Air baffle" on page 40).

5. Remove the processor fan bracket.



6. Remove all hot-plug fans from the processor fan bracket ("Hot-plug fan" on page 36).

To replace the component, reverse the removal steps and press down on the top of each fan to be sure it is seated properly.

Front bezel

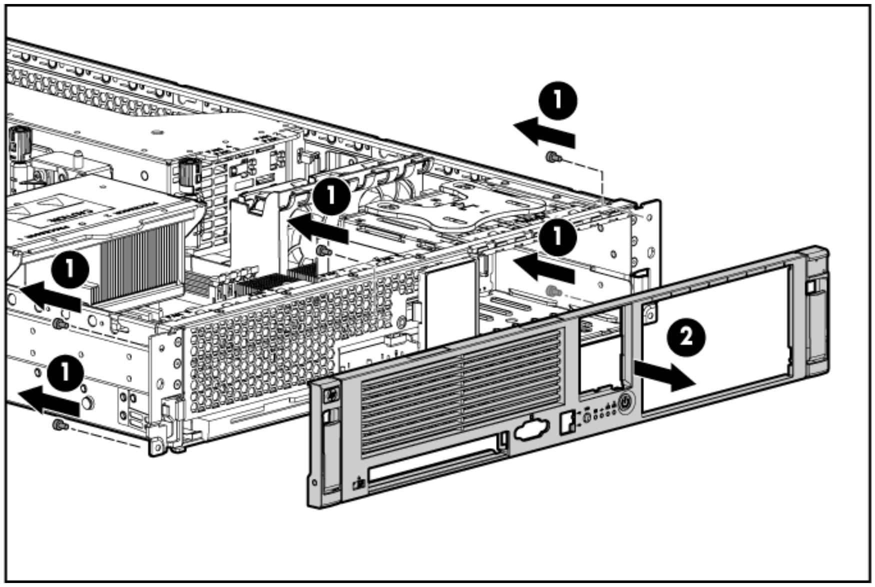
To remove the component:

1. Power down the server (on page 28).
2. Extend or remove the server from the rack ("Extend the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Access panel" on page 30).
4. Remove the air baffle ("Air baffle" on page 40).

> **IMPORTANT:** For this procedure, you do not need to remove the hot-plug fans from the processor fan bracket. When reinstalling the processor fan bracket, press the top of each fan to be sure it seats securely.

5. Remove the processor fan bracket ("Processor fan bracket" on page 41).

6. Remove the five T-15 Torx screws and detach the front bezel.



To replace the component, reverse the removal procedure.

Systems Insight Display

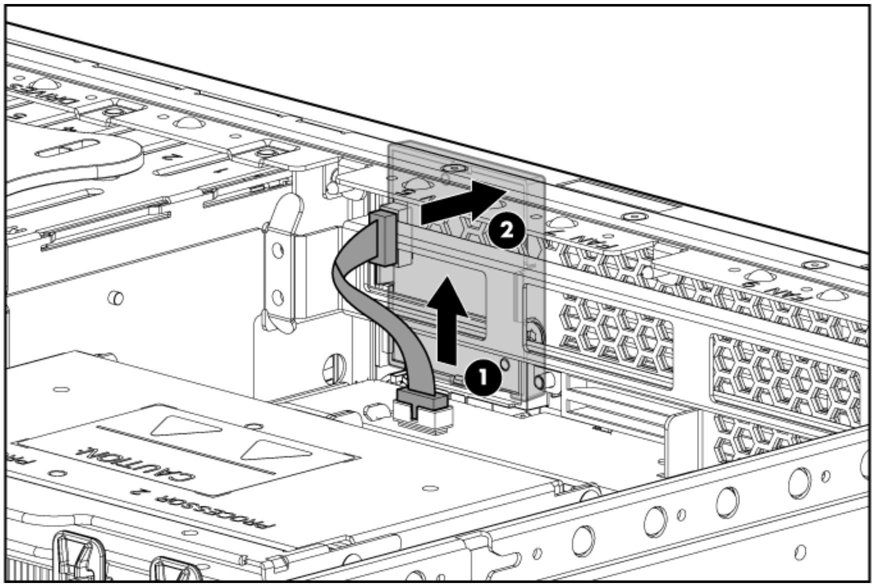
To remove the component:

1. Power down the server (on page 28).
2. Extend the server from the rack (on page 27).
3. Remove the access panel ("Access panel" on page 30).
4. Remove the air baffle ("Air baffle" on page 40).

> **IMPORTANT:** For this procedure, you do not need to remove the hot-plug fans from the processor fan bracket. When reinstalling the processor fan bracket, press the top of each fan to be sure it seats securely.

5. Remove the processor fan bracket ("Processor fan bracket" on page 41).
6. Disconnect the Systems Insight Display cable.

7. Remove the Systems Insight Display.



To replace the component, reverse the removal procedure.

Fan board

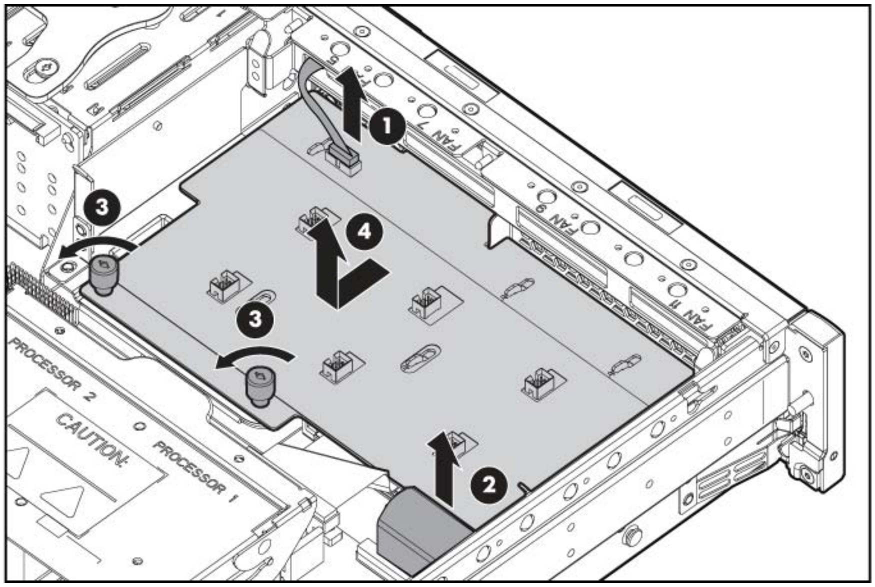
To remove the component:

1. Power down the server (on page 28).
2. Extend the server from the rack (on page 27).
3. Remove the access panel ("Access panel" on page 30).
4. Remove the air baffle ("Air baffle" on page 40).

IMPORTANT: For this procedure, you do not need to remove the hot-plug fans from the processor fan bracket. When reinstalling the processor fan bracket, press the top of each fan to be sure it seats securely.

5. Remove the processor fan bracket ("Processor fan bracket" on page 41).
6. Disconnect the Systems Insight Display cable and the fan board cable.

7. Remove the fan board.



To replace the component, reverse the removal procedure.

Processor fan bracket plate

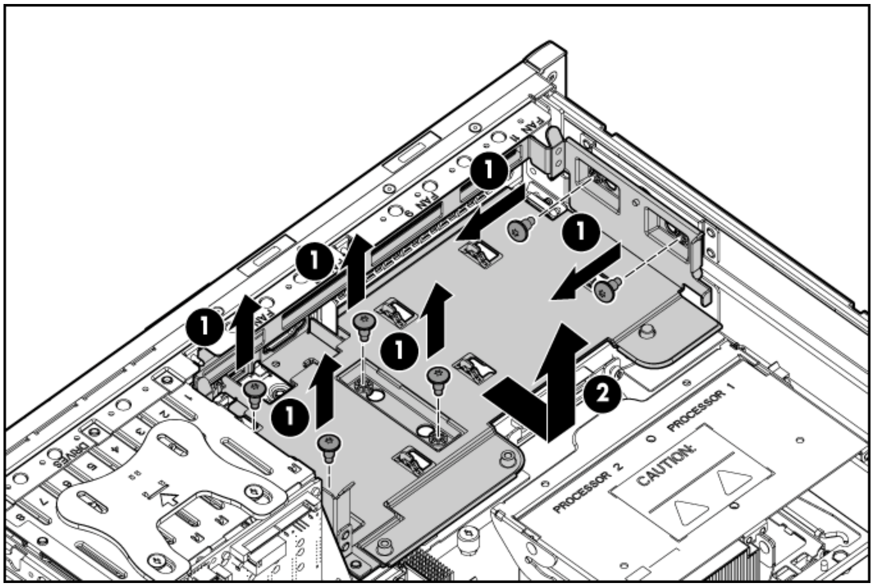
To remove the component:

1. Power down the server (on page 28).
2. Extend or remove the server from the rack ("Extend the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Access panel" on page 30).
4. Remove the air baffle ("Air baffle" on page 40).

> **IMPORTANT:** For this procedure, you do not need to remove the hot-plug fans from the processor fan bracket. When reinstalling the processor fan bracket, press the top of each fan to be sure it seats securely.

5. Remove the processor fan bracket ("Processor fan bracket" on page 41).
6. Remove the fan board ("Fan board" on page 44).

7. Remove the processor fan bracket plate.



To replace the component, reverse the removal procedure.

Media drive ejector assembly

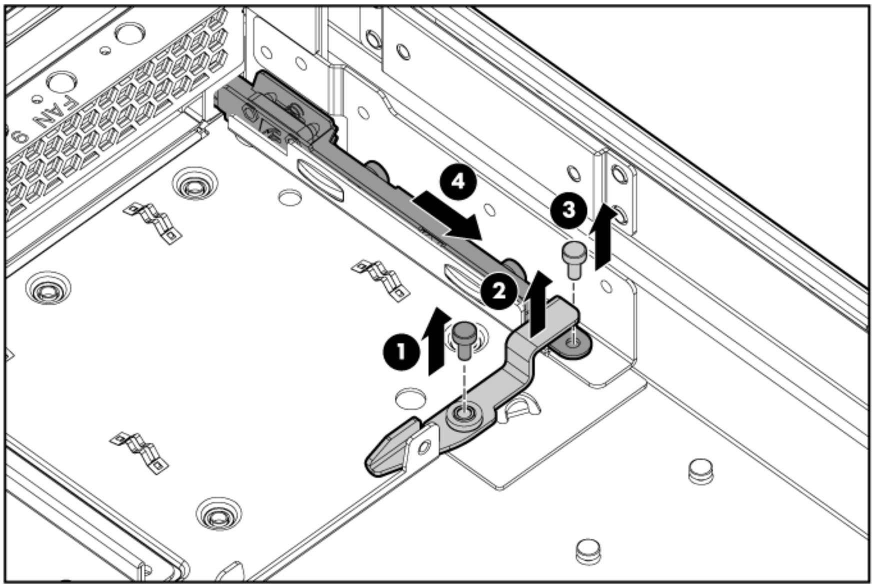
To remove the component:

1. Power down the server (on page 28).
2. Extend or remove the server from the rack ("Extend the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Access panel" on page 30).
4. Remove the air baffle ("Air baffle" on page 40).

> **IMPORTANT:** For this procedure, you do not need to remove the hot-plug fans from the processor fan bracket. When reinstalling the processor fan bracket, press the top of each fan to be sure it seats securely.

5. Remove the processor fan bracket ("Processor fan bracket" on page 41).
6. Remove the media drive ("Media drive or blank" on page 35).
7. Remove the fan board ("Fan board" on page 44).

8. Remove the ejector assembly.

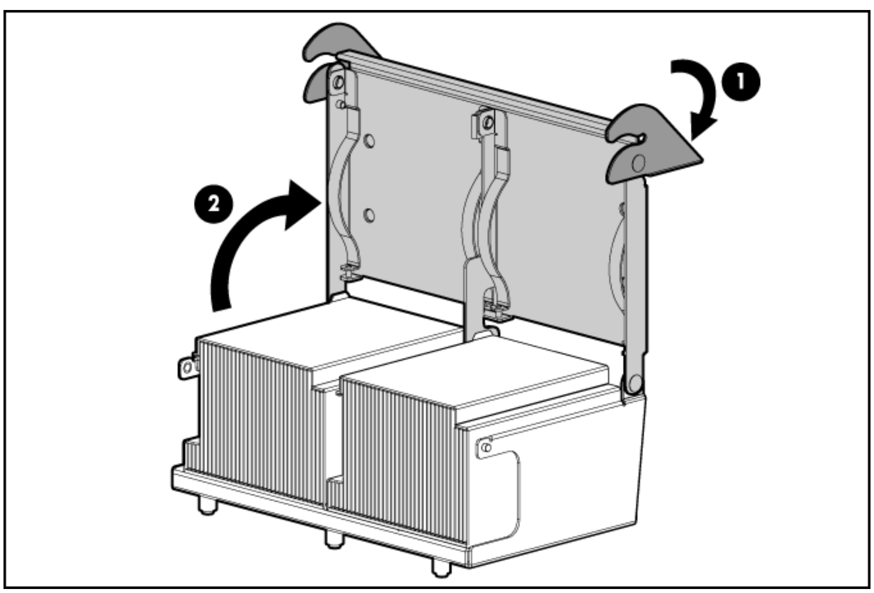


To replace the component, reverse the removal procedure.

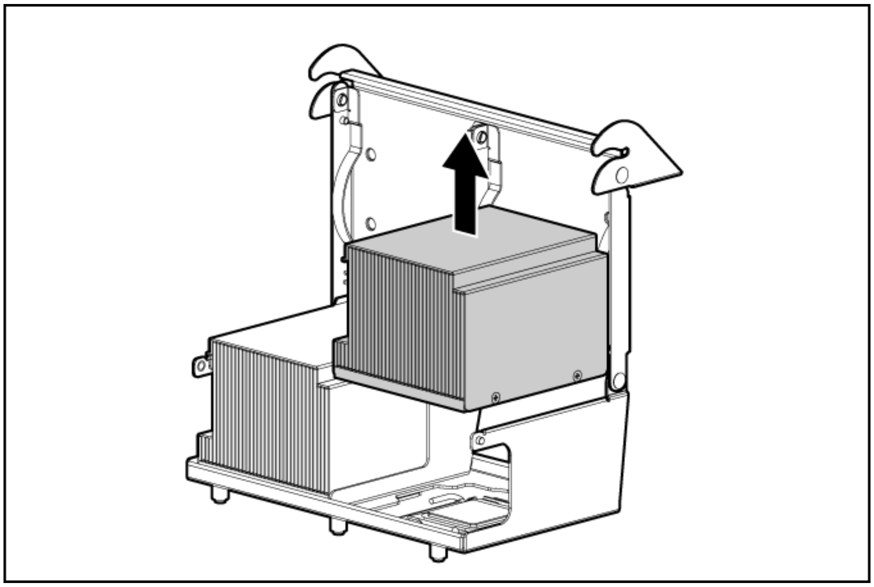
Heatsink

To remove the heatsink:

1. Power down the server (on page 28).
2. Extend the server from the rack (on page 27).
3. Remove the access panel ("Access panel" on page 30).
4. Remove the air baffle ("Air baffle" on page 40).
5. Open the heatsink retaining bracket.

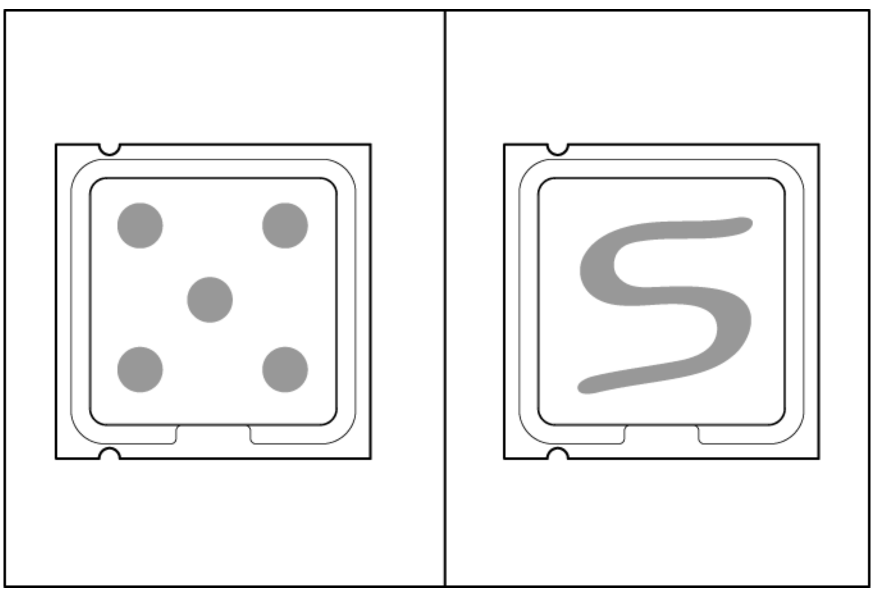


6. Remove the heatsink.

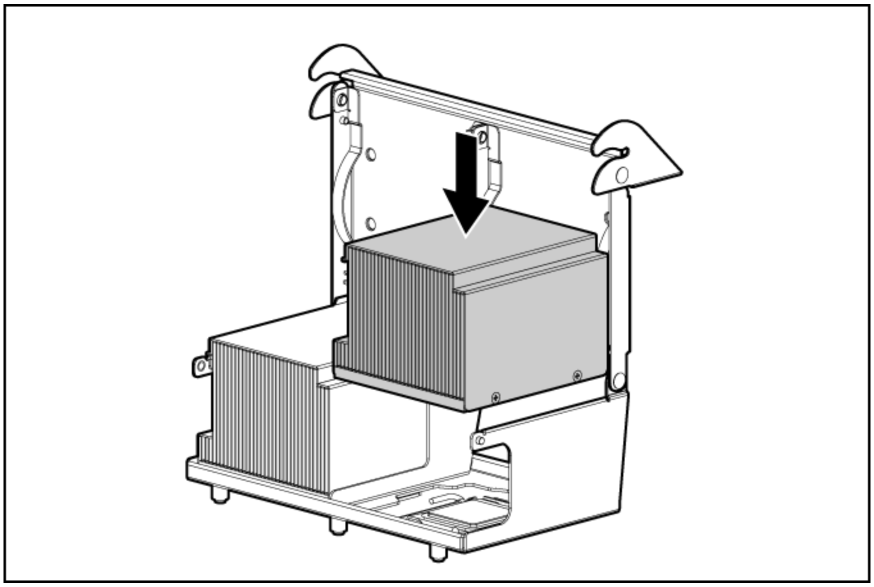


To replace the heatsink:

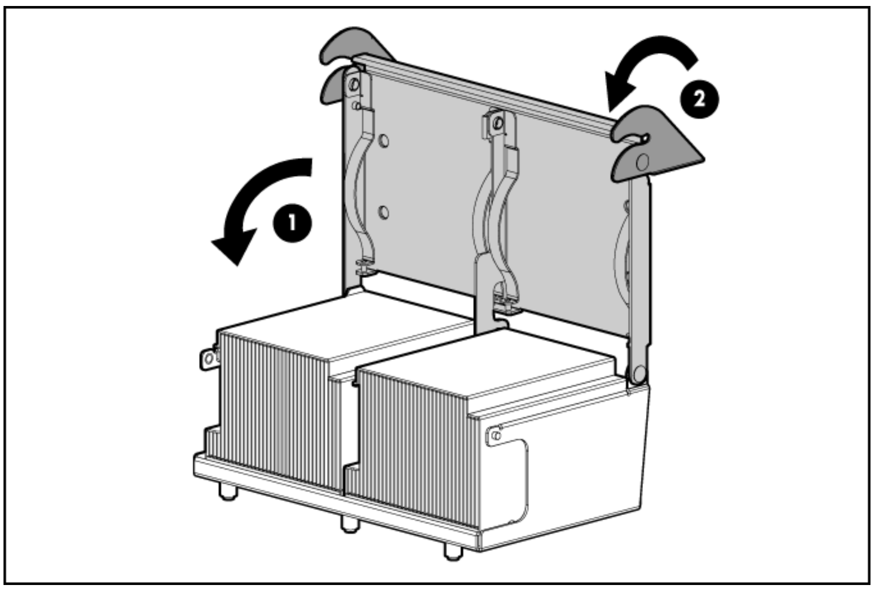
1. Clean the old thermal grease from the processor with the alcohol swab. Allow the alcohol to evaporate before continuing.
2. Apply all the grease to the top of the processor in one of the following patterns to ensure even distribution:



3. Install the heatsink.



4. Close and lock the heatsink retaining latches.



5. Install the air baffle.
6. Install the access panel ("Access panel" on page 30).
7. Install the server into the rack.
8. Power up the server.

Processor

CAUTION: To avoid damage to the processor and system board, only authorized personnel should attempt to replace or install the processor in this server.

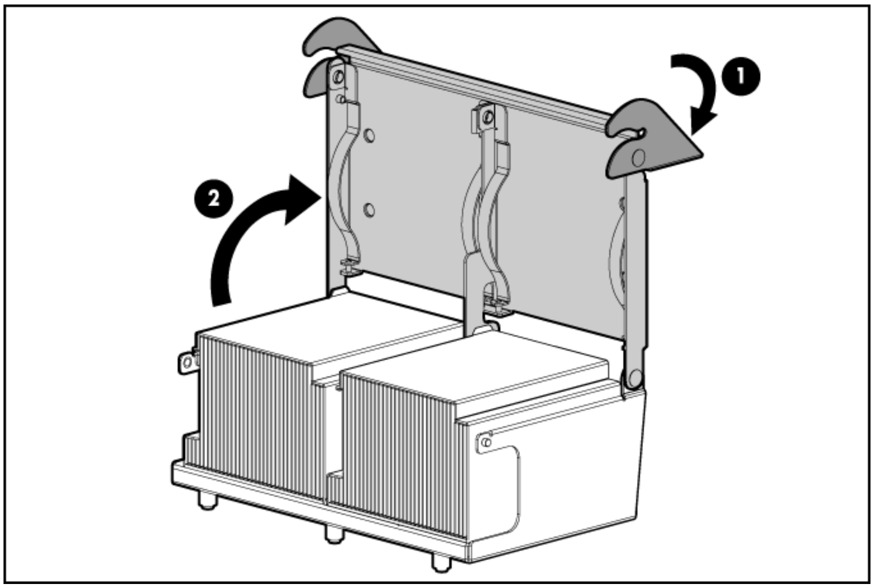
CAUTION: To prevent possible server malfunction and damage to the equipment, multiprocessor configurations must contain processors with the same part number.

IMPORTANT: Processor socket 1 and PPM slot 1 must be populated at all times or the server does not function properly.

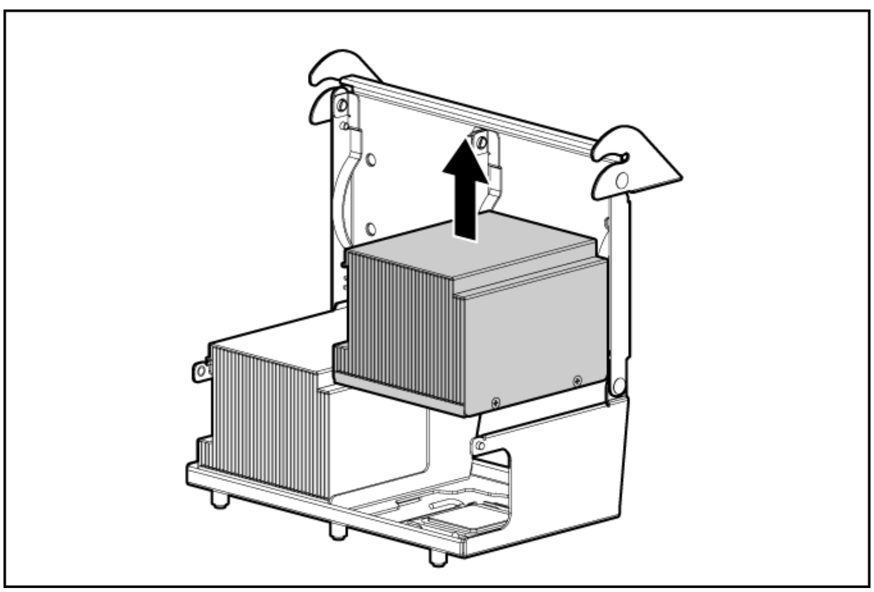
IMPORTANT: Always install a PPM when you install a processor. The system fails to boot if the corresponding PPM is missing.

To remove a processor:

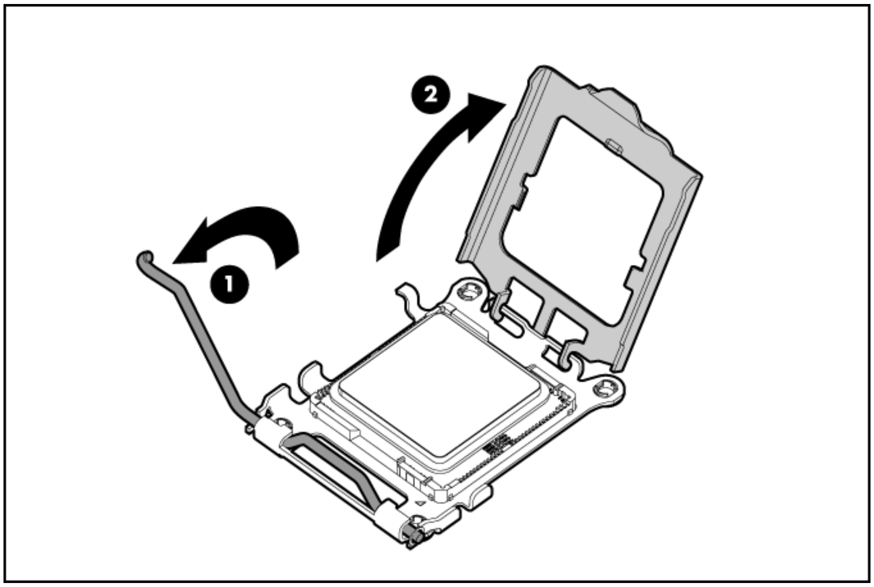
1. Power down the server (on page 28).
2. Extend the server from the rack (on page 27).
3. Remove the access panel ("Access panel" on page 30).
4. Remove the air baffle ("Air baffle" on page 40).
5. Open the heatsink retaining bracket.



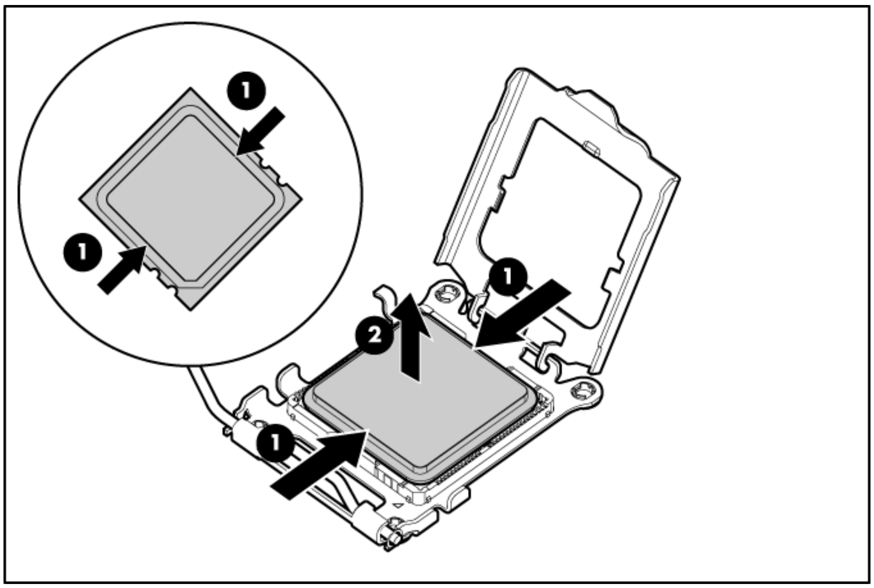
6. Remove the heatsink.



7. Open the processor retaining latch and the processor socket retaining bracket.



8. Using your fingers, remove the failed processor.



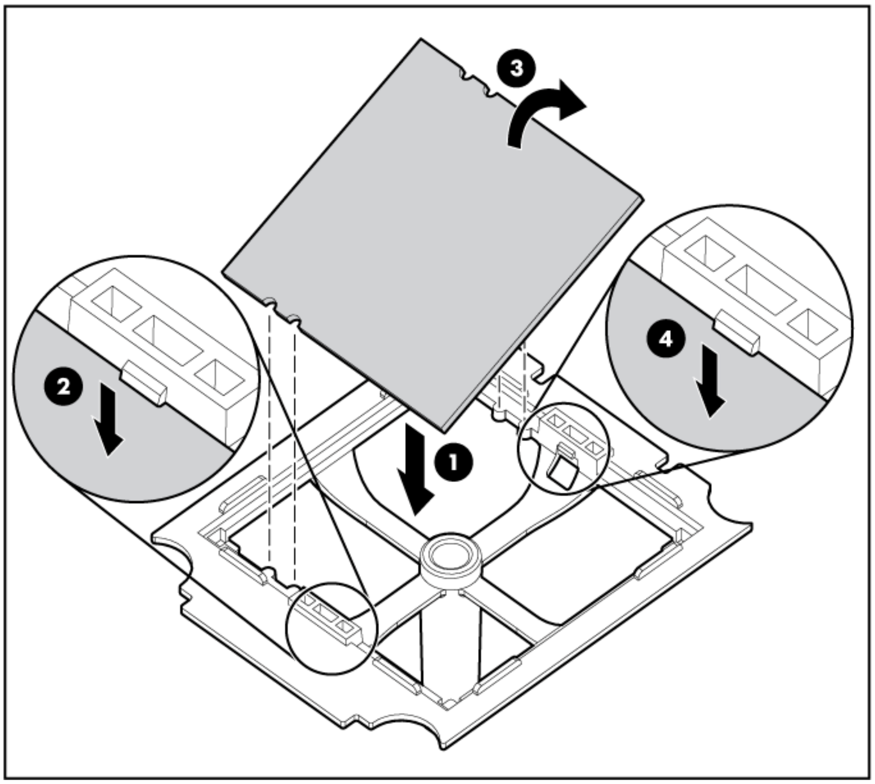
To replace a processor:

> **CAUTION:** The pins on the processor socket are very fragile. Any damage to them may require replacing the system board.

> **CAUTION:** Failure to completely open the processor locking lever prevents the processor from seating during installation, leading to hardware damage.

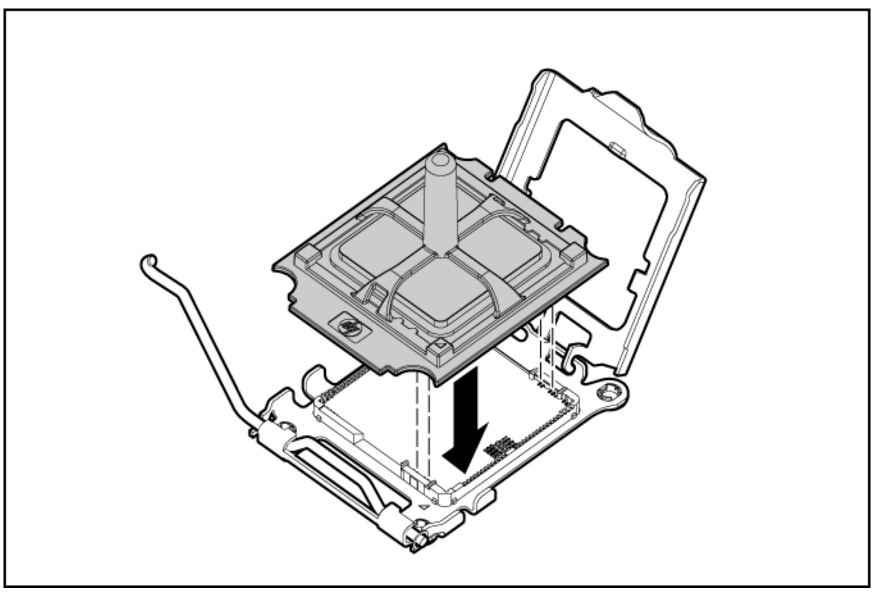
> **IMPORTANT:** Be sure the processor remains inside the processor installation tool.

1. If the processor has separated from the installation tool, carefully re-insert the processor in the tool.

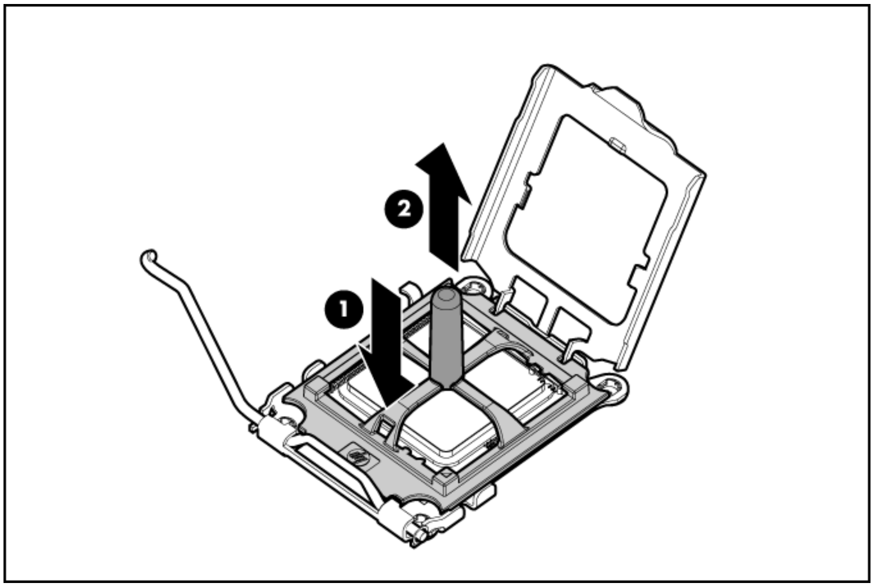


2. Align the processor installation tool with the socket and install the processor.

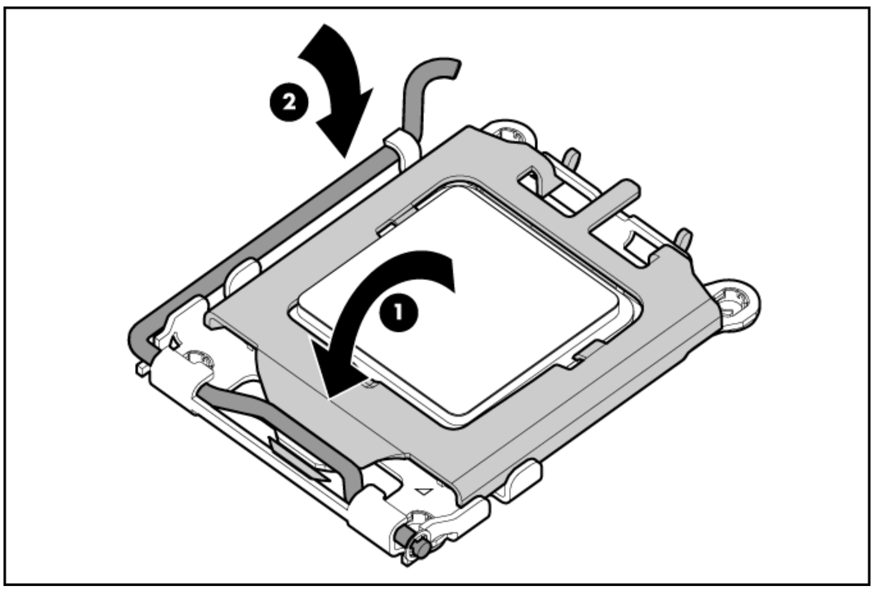
> △ **CAUTION:** The processor is designed to fit one way into the socket. Use the alignment guides on the processor and socket to properly align the processor with the socket.



3. Press down firmly until the processor installation tool clicks and separates from the processor, and then remove the processor installation tool.

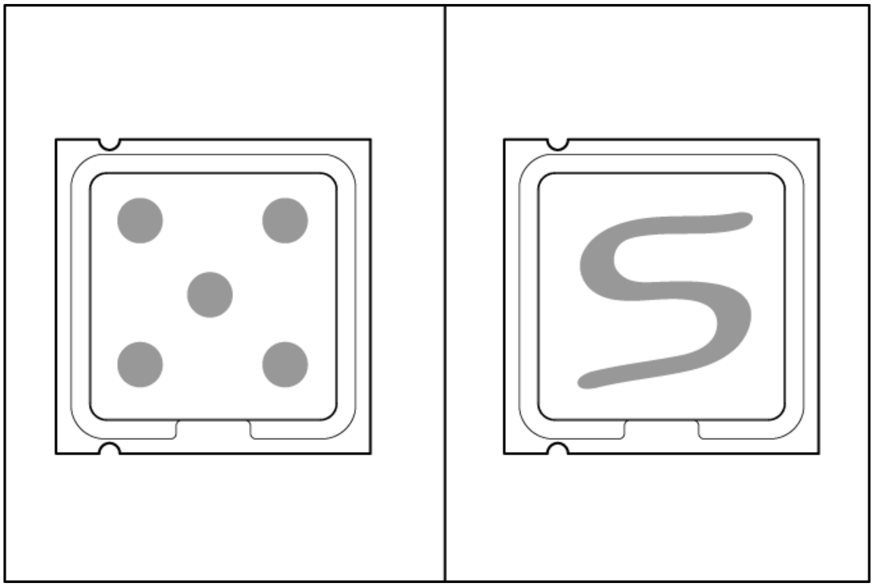


4. Close the processor retaining bracket and the processor retaining latch.

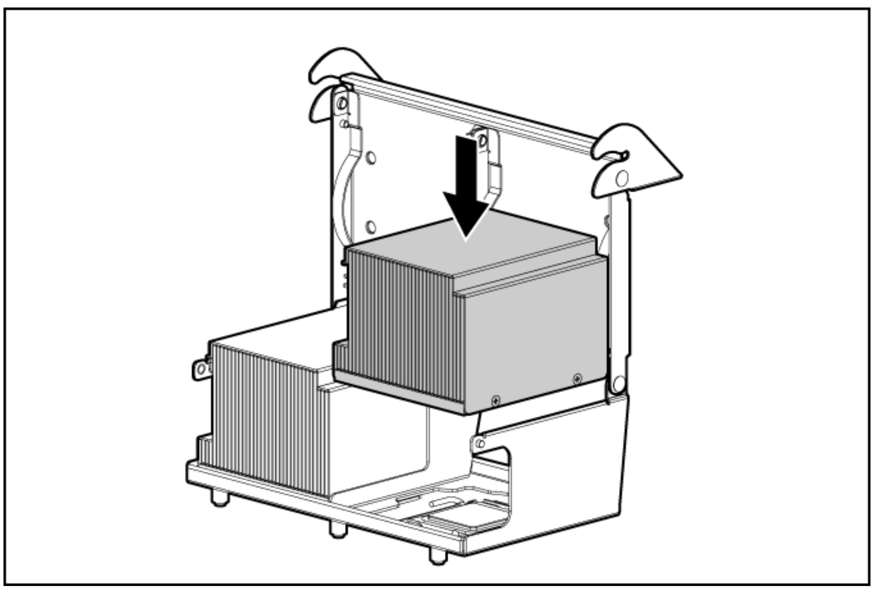


5. Clean the old thermal grease from the heatsink with the alcohol swab. Allow the alcohol to evaporate before continuing.

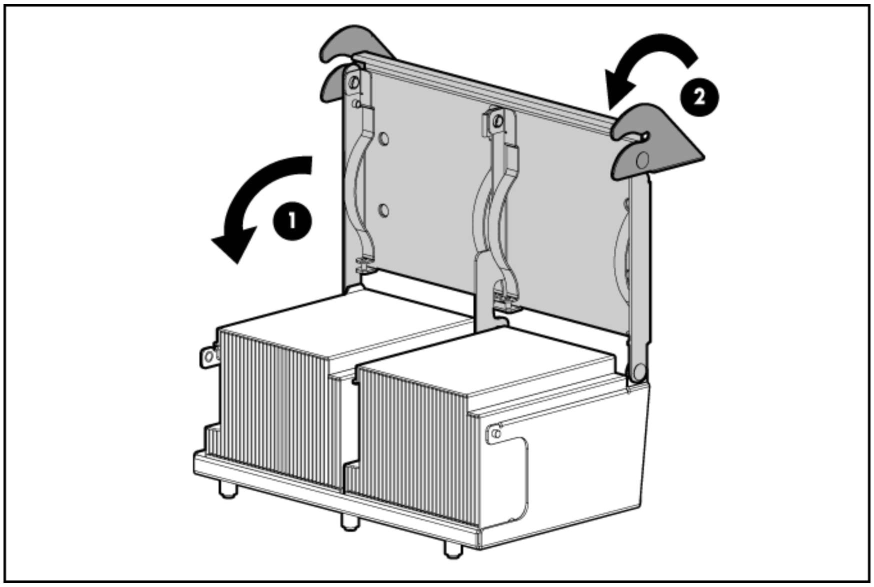
6. Apply all the grease to the top of the processor in one of the following patterns to ensure even distribution:



7. Install the heatsink.



8. Close and lock the heatsink retaining latches.



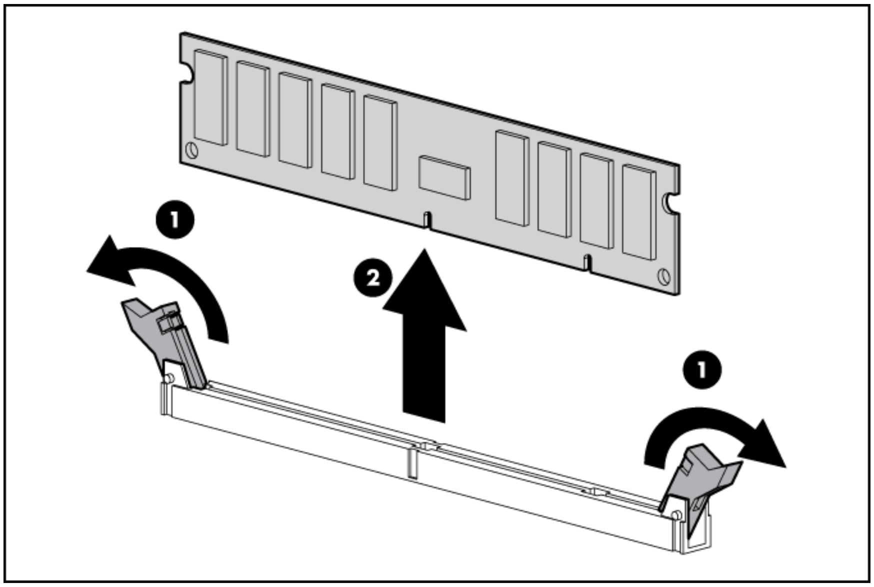
9. Install the air baffle.
10. Install the access panel ("Access panel" on page 30).
11. Install the server into the rack.
12. Power up the server.

DIMMs

To remove the component:

1. Power down the server (on page 28).
2. Extend or remove the server from the rack ("Extend the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Access panel" on page 30).
4. Remove the air baffle ("Air baffle" on page 40).

5. Remove the DIMM.



To replace the component, reverse the removal procedure.

Memory options

You can expand server memory by installing PC2-5300 Registered DDR2 SDRAM DIMMs. The server supports up to 32 GB of memory using eight 4-GB DIMMs (four DIMMs per processor).

For DIMM slot locations and bank assignments, see "DIMM slots (on page 90)."

Advanced ECC memory

This server uses Advanced ECC for memory protection. In Advanced ECC, the server is protected against correctable memory errors. The server provides notification if the level of correctable errors exceeds a pre-defined threshold rate. The server does not fail because of correctable memory errors. Advanced ECC provides additional protection over Standard ECC because it is possible to correct certain memory errors that would otherwise be uncorrectable and result in a server failure.

Whereas standard ECC can correct single-bit memory errors, Advanced ECC can correct single-bit memory errors and multi-bit memory errors if all failed bits are on the same DRAM device on the DIMM.

DIMM installation guidelines

Observe the following guidelines when installing additional memory:

- Always install memory in pairs of two identical DIMMs.
- Install only ECC PC2-5300 Registered DDR2 SDRAM DIMMs that meet the following specifications:
  - Supply voltage: 1.8 V
  - Bus width: 72 bits
- Install DIMMs with the same speed.
- Install memory in pairs (banks) beginning with banks farthest away from each populated processor (banks A and C).
- Observe the following special conditions when installing memory with a second processor:

- Processor 2 can be installed without memory.
- Any memory installed into banks for processor 2 can be used only if processor 2 is installed.

CAUTION: Always wear an antistatic wrist strap when working inside the server.

DIMM population order

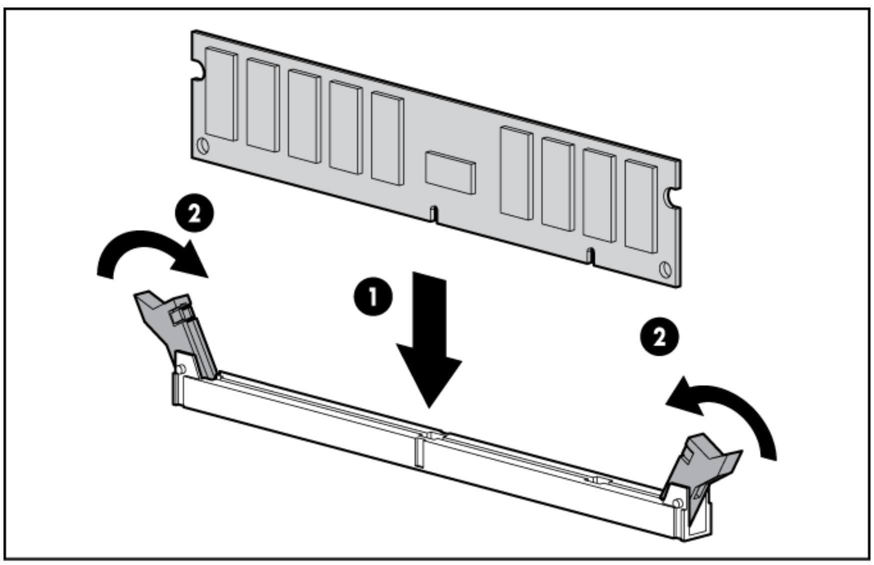
Configuration	Bank A 1A and 2A	Bank B 3B and 4B	Bank C 5C and 6C	Bank D 7D and 8D
Single processor	1st	2nd	—	—
Dual processor	1st	3rd	2nd	4th

Installing DIMMs

1. Power down the server (on page 28).
2. Extend the server from the rack (on page 27).
3. Remove the access panel ("Access panel" on page 30).
4. Remove the air baffle.
5. Open the DIMM slot latches.

IMPORTANT: Always install memory in pairs of two identical DIMMs.

6. Install the DIMM.



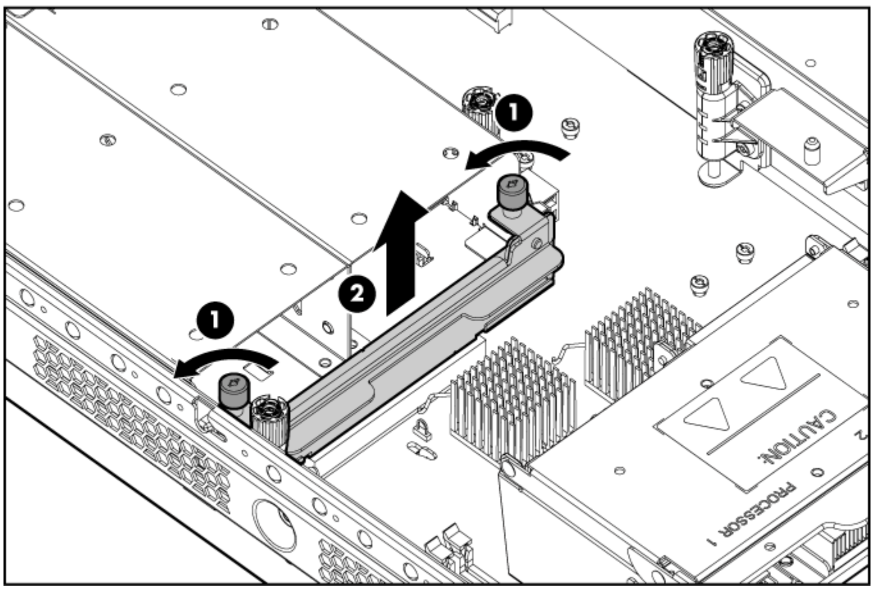
7. Install the air baffle.
8. Install the access panel ("Access panel" on page 30).
9. Install the server into the rack.
10. Power up the server.

For more information about LEDs and troubleshooting failed DIMMs, see "Systems Insight Display LEDs and internal health LED combinations (on page 92)."

Power supply backplane

To remove the component:

1. Power down the server (on page 28).
2. Remove all power supplies ("Hot-plug power supply" on page 32).
3. Extend or remove the server from the rack ("Extend the server from the rack" on page 27, "Remove the server from the rack" on page 29).
4. Remove the access panel ("Access panel" on page 30).
5. Remove the air baffle ("Air baffle" on page 40).
6. Remove the power supply backplane.



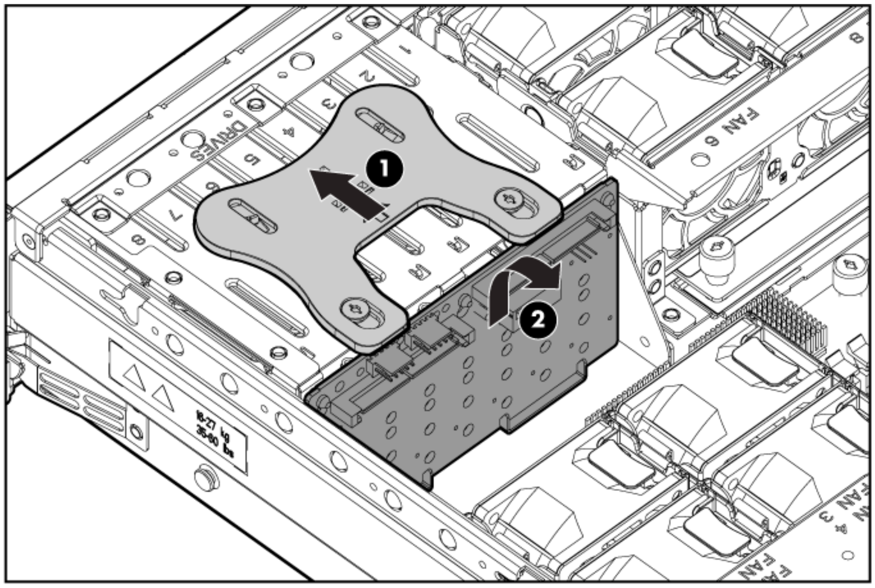
To replace the component, reverse the removal procedure.

Hard drive backplane

To remove the component:

1. Power down the server (on page 28).
2. Extend or remove the server from the rack ("Extend the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Access panel" on page 30).
4. Remove all hot-plug hard drives ("Hot-plug SAS hard drive" on page 31).

5. Remove the hard drive backplane.

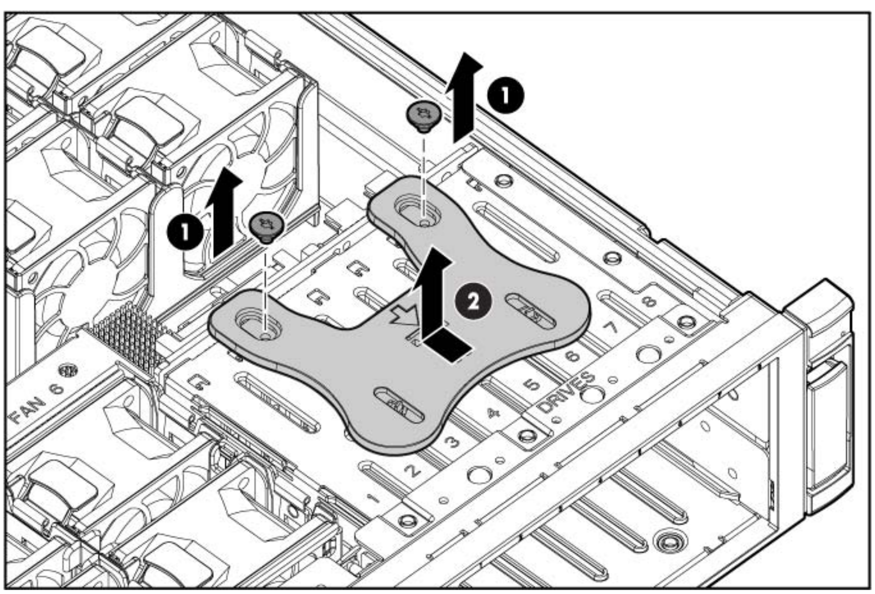


To replace the component, reverse the removal procedure.

Hard drive backplane retainer

To remove the component:

1. Power down the server (on page 28).
2. Extend or remove the server from the rack ("Extend the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Access panel" on page 30).
4. Remove all hot-plug hard drives ("Hot-plug SAS hard drive" on page 31).
5. Remove the hard drive backplane ("Hard drive backplane" on page 58).
6. Remove the hard drive backplane retainer.



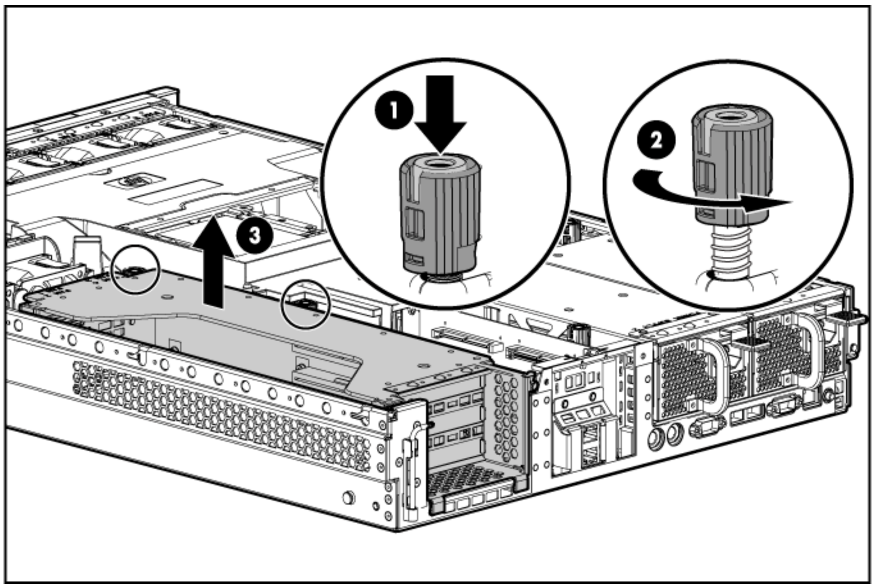
To replace the component, reverse the removal procedure.

PCI riser cage

To remove the component:

△ **CAUTION:** To prevent improper cooling and thermal damage, do not operate the server unless all PCI slots have either an expansion slot cover or an expansion board installed.

1. Power down the server (on page 28).
2. Extend the server from the rack (on page 27).
3. Remove the access panel ("Access panel" on page 30).
4. Disconnect any internal or external cables connected to any existing expansion boards.
5. Press the blue buttons to release the black knobs.
6. Turn the black knobs counter-clockwise.
7. Remove the PCI riser cage.



To replace the component, reverse the removal procedure.

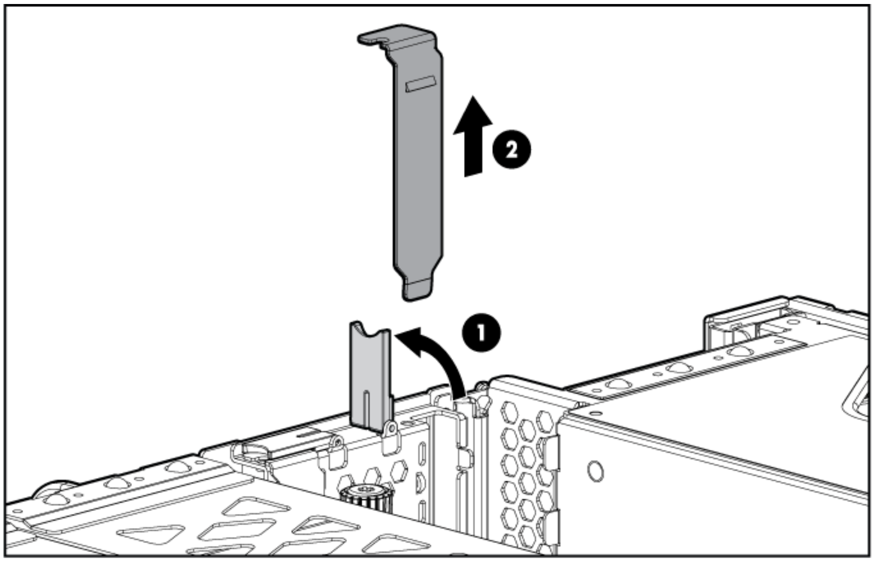
Expansion slot covers

Expansion slot covers (1 and 2)

△ **CAUTION:** To prevent improper cooling and thermal damage, do not operate the server unless all PCI slots have either an expansion slot cover or an expansion board installed.

1. Power down the server (on page 28).
2. Extend or remove the server from the rack ("Extend the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Access panel" on page 30).

4. Remove the expansion slot cover.



To replace the component, reverse the removal procedure.

Expansion slot covers (3, 4, and 5)

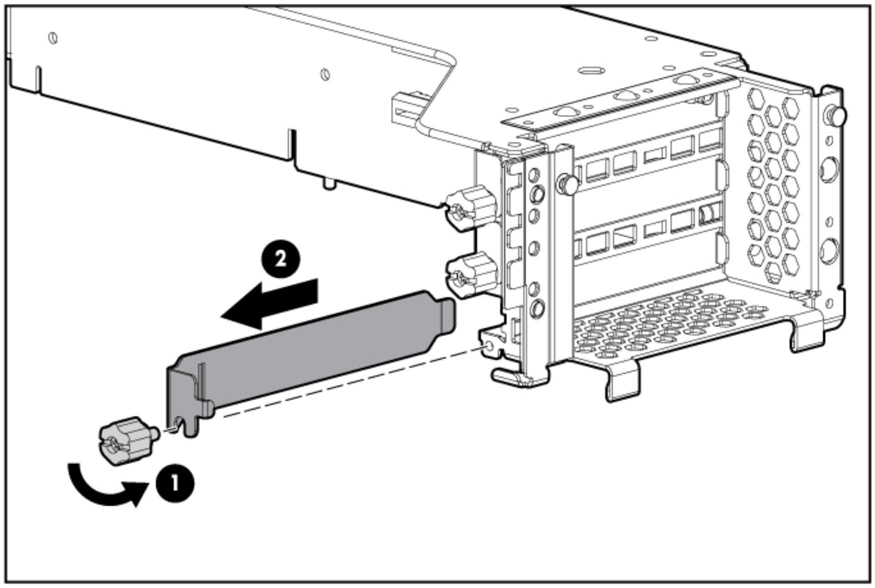
To remove the component:

1. Power down the server (on page 28).
2. Extend or remove the server from the rack ("Extend the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Access panel" on page 30).

> **CAUTION:** To prevent damage to the server or expansion boards, power down the server and remove all AC power cords before removing or installing the PCI riser cage.

4. Disconnect any internal or external cables connected to any existing expansion boards.
5. Remove the PCI riser cage ("PCI riser cage" on page 60).

6. Remove the expansion slot cover.

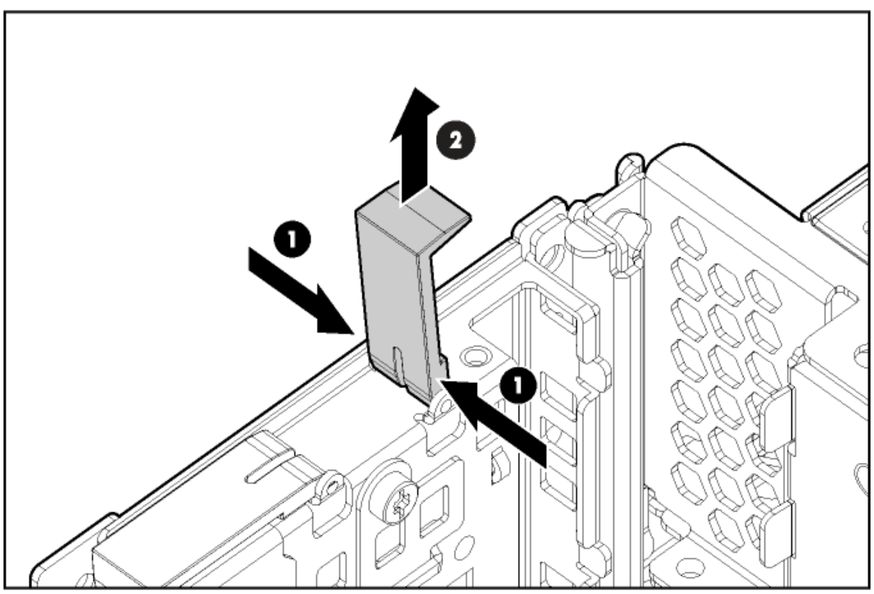


To replace the component, reverse the removal procedure.

Expansion slot cover retainer (slots 1 and 2)

To remove the component:

1. Power down the server (on page 28).
2. Extend or remove the server from the rack ("Extend the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Access panel" on page 30).
4. Open the expansion slot cover retainer.
5. Remove the expansion slot cover retainer.



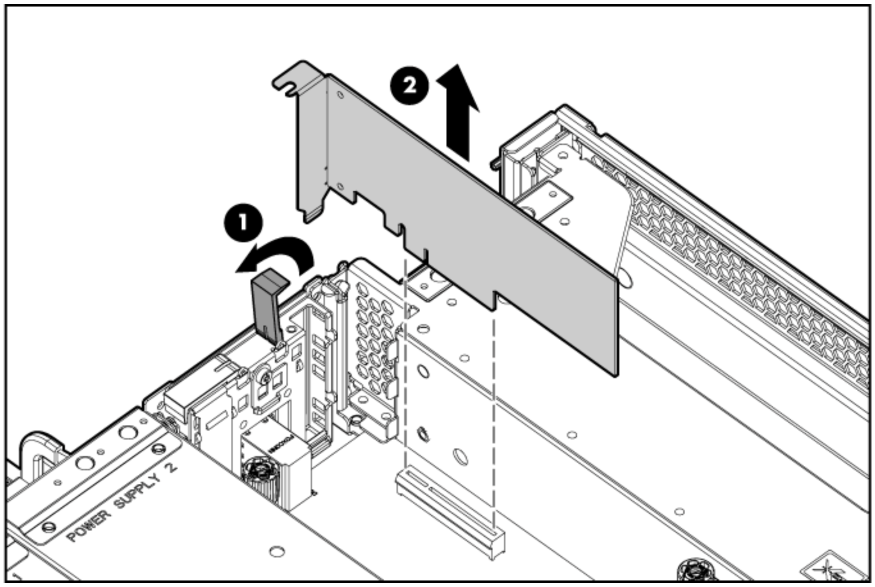
To replace the component, reverse the removal procedure.

Expansion boards

Expansion board (slots 1 and 2)

To remove the component:

1. Power down the server (on page 28).
2. Extend or remove the server from the rack ("Extend the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Access panel" on page 30).
4. Disconnect any internal or external cables connected to the expansion board.
5. Remove the expansion board.



> **CAUTION:** To prevent improper cooling and thermal damage, do not operate the server unless all PCI slots have either an expansion slot cover or an expansion board installed.

To replace the component, reverse the removal procedure.

Removing expansion board (slots 3, 4, and 5)

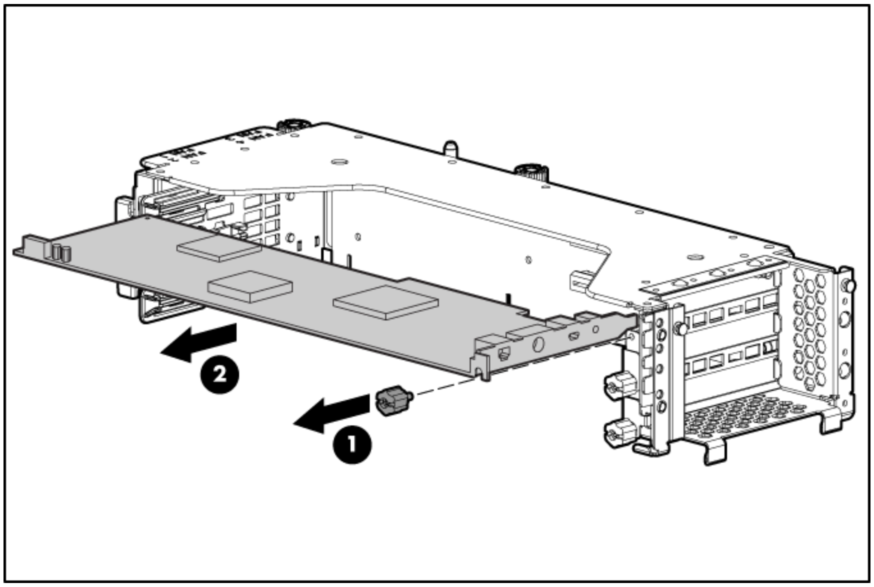
To remove the component:

1. Power down the server (on page 28).
2. Extend or remove the server from the rack ("Extend the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Access panel" on page 30).

> **CAUTION:** To prevent damage to the server or expansion boards, power down the server and remove all AC power cords before removing or installing the PCI riser cage.

4. Disconnect any internal or external cables connected to any existing expansion boards in the PCI riser cage.

5. Remove the PCI riser cage ("PCI riser cage" on page 60).
6. Remove the expansion board.



> **CAUTION:** To prevent improper cooling and thermal damage, do not operate the server unless all PCI slots have either an expansion slot cover or an expansion board installed.

To replace the component, reverse the removal procedure.

Battery

If the server no longer automatically displays the correct date and time, you may need to replace the battery that provides power to the real-time clock.

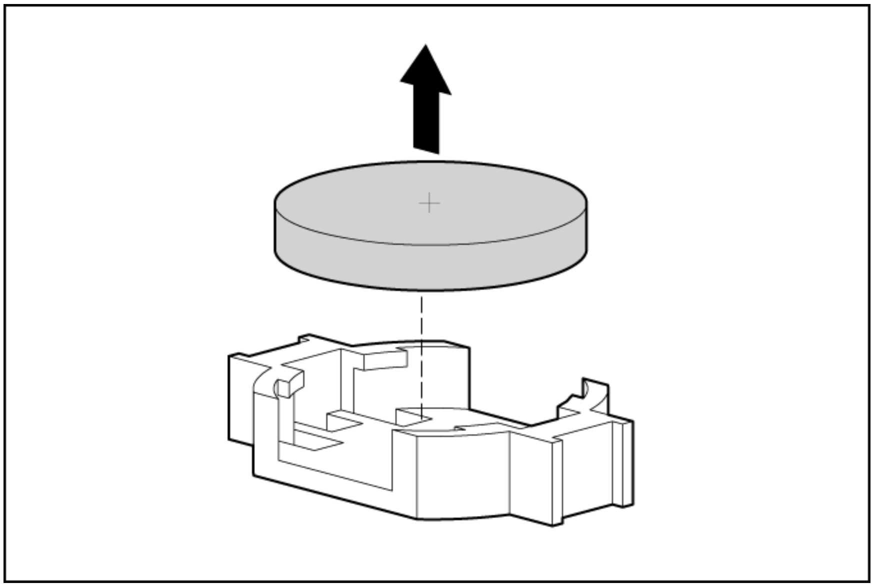
> **WARNING:** The computer contains an internal lithium manganese dioxide, a vanadium pentoxide, or an alkaline battery pack. A risk of fire and burns exists if the battery pack is not properly handled. To reduce the risk of personal injury:
>
> - Do not attempt to recharge the battery.
> - Do not expose the battery to temperatures higher than 60°C (140°F).
> - Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.
> - Replace only with the spare designated for this product.

To remove the component:

1. Power down the server (on page 28).
2. Extend or remove the server from the rack ("Extend the server from the rack" on page 27, "Remove the server from the rack" on page 29).
3. Remove the access panel ("Access panel" on page 30).
4. Remove the PCI riser cage ("PCI riser cage" on page 60).

> **CAUTION:** To prevent damage to the server or expansion boards, power down the server and remove all AC power cords before removing or installing the PCI riser cage.

5. Remove the battery.



IMPORTANT: Replacing the system board battery resets the system ROM to its default configuration. After replacing the battery, reconfigure the system through RBSU.

To replace the component, reverse the removal procedure.

For more information about battery replacement or proper disposal, contact an authorized reseller or an authorized service provider.

System board

To remove the component:

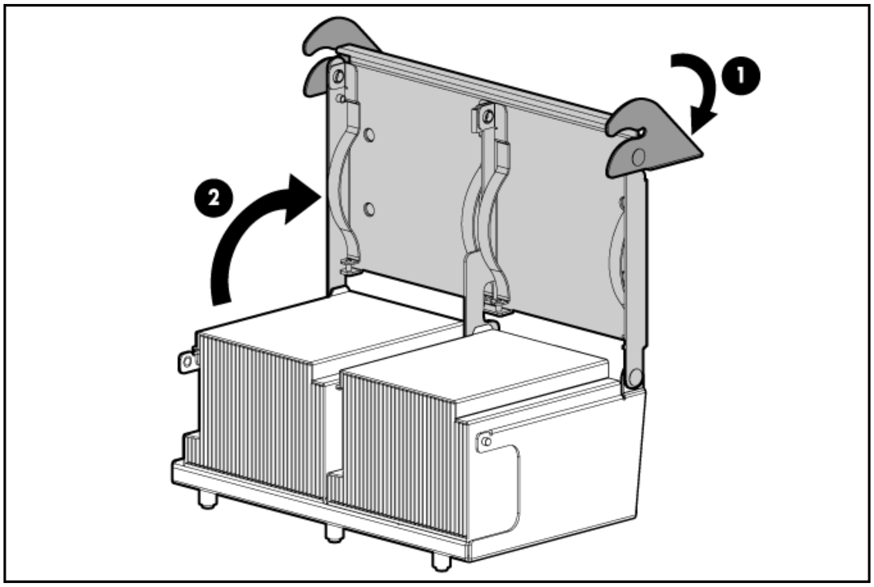
1. Power down the server (on page 28).
2. Remove all power supplies ("Hot-plug power supply" on page 32).
3. Extend or remove the server from the rack ("Extend the server from the rack" on page 27, "Remove the server from the rack" on page 29).
4. Remove the access panel ("Access panel" on page 30).
5. Remove the power supply cage assembly ("Power supply cage assembly" on page 37).
6. Remove the battery pack ("Removing the battery pack" on page 39).
7. Remove the air baffle ("Air baffle" on page 40).
8. Remove the power supply backplane ("Power supply backplane" on page 58).

CAUTION: To prevent damage to the server or expansion boards, power down the server and remove all AC power cords before removing or installing the PCI riser cage.

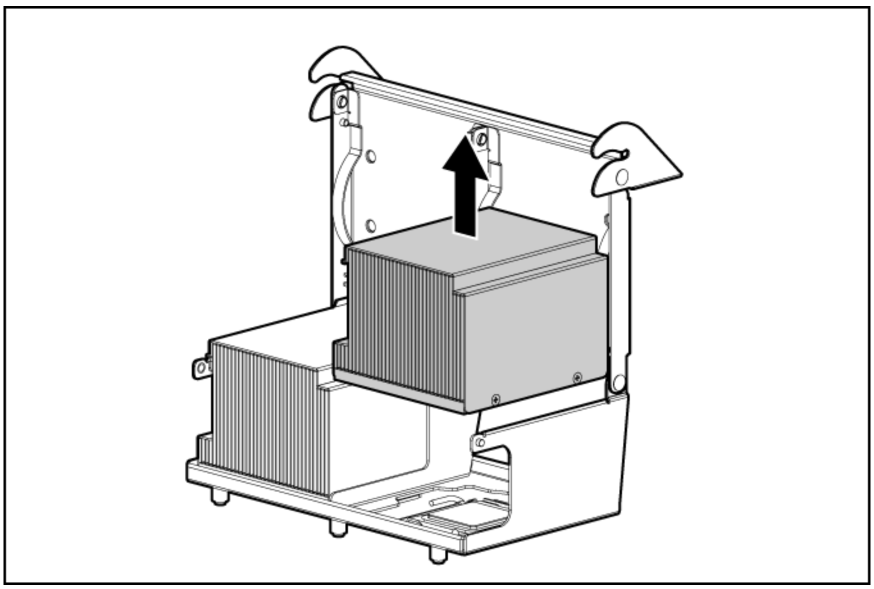
9. Remove the PCI riser cage ("PCI riser cage" on page 60).
10. Remove expansion boards from slots 1 and 2 ("Expansion board (slots 1 and 2)" on page 63).

IMPORTANT: For this procedure, you do not need to remove the hot-plug fans from the processor fan bracket. When reinstalling the processor fan bracket, press the top of each fan to be sure it seats securely.

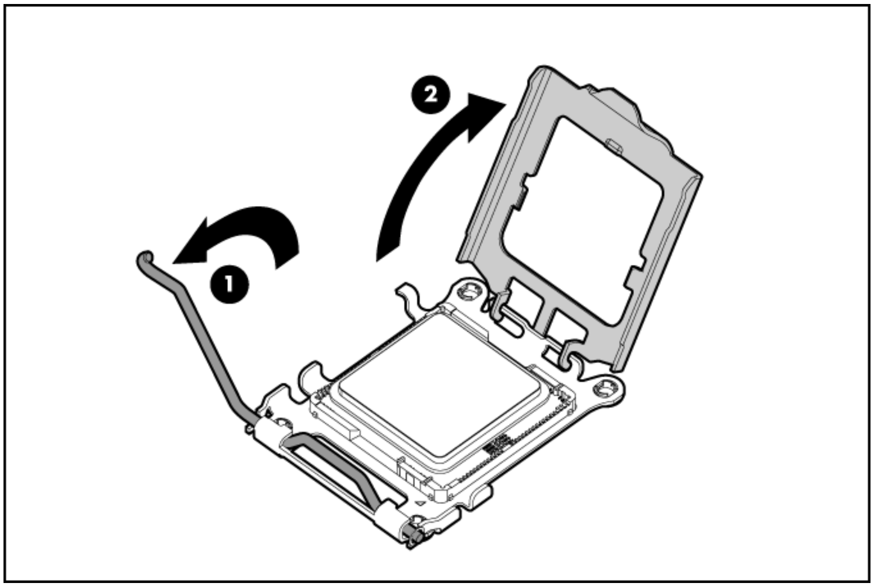
11. Remove the processor fan bracket ("Processor fan bracket" on page 41).
12. Remove the hot-plug fans from the I/O fan bracket ("Hot-plug fan" on page 36).
13. Remove all DIMMs ("DIMMs" on page 55).
14. Open the heatsink retaining bracket.



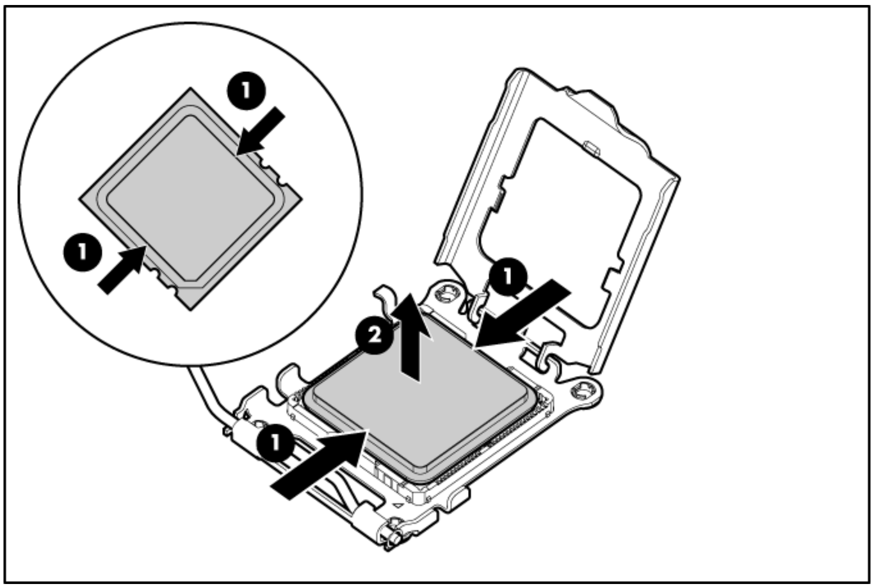
15. Remove the heatsink.



16. Open the processor retaining latch and the processor socket retaining bracket.



17. Using your fingers, remove the failed processor.



CAUTION: To avoid damage to the system board:

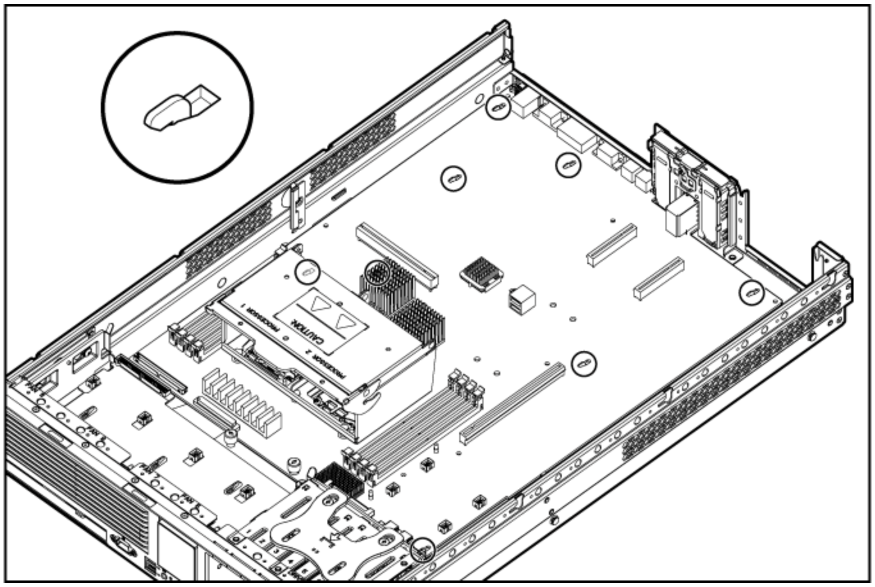
- Do not touch the socket contacts.
- Always install the processor socket cover after removing the processor from the socket.
- Do not tilt or slide the processor when removing the processor from the socket.

CAUTION: To avoid damage to the processor:

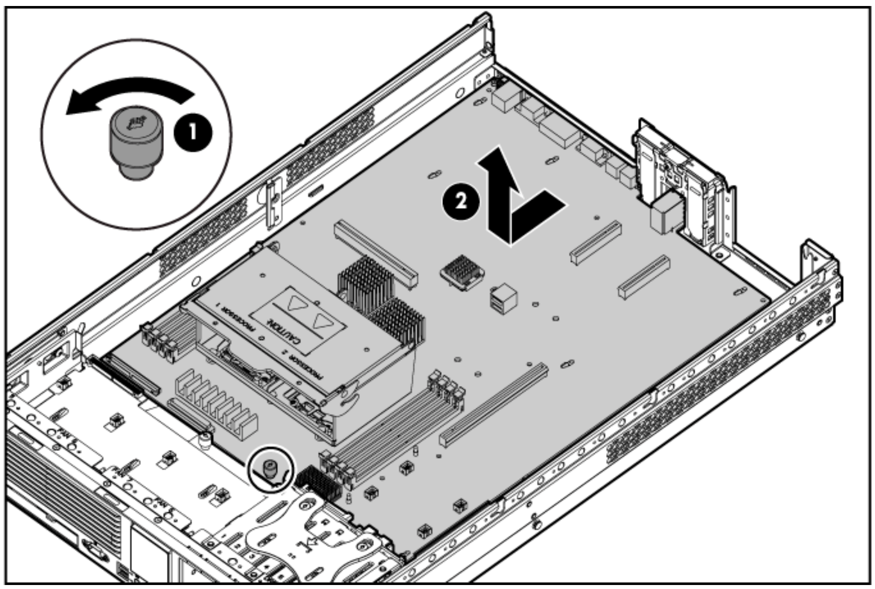
- Handle the processor only by the edges.
- Do not touch the bottom of the processor, especially the contact area.

18. Disconnect all cables connected to the system board.

19. Identify the eight alignment keys and keyhole locations.



20. Loosen the system board thumbscrew.
21. Remove the failed system board.



22. Remove the I/O fan bracket ("I/O fan bracket" on page 72).

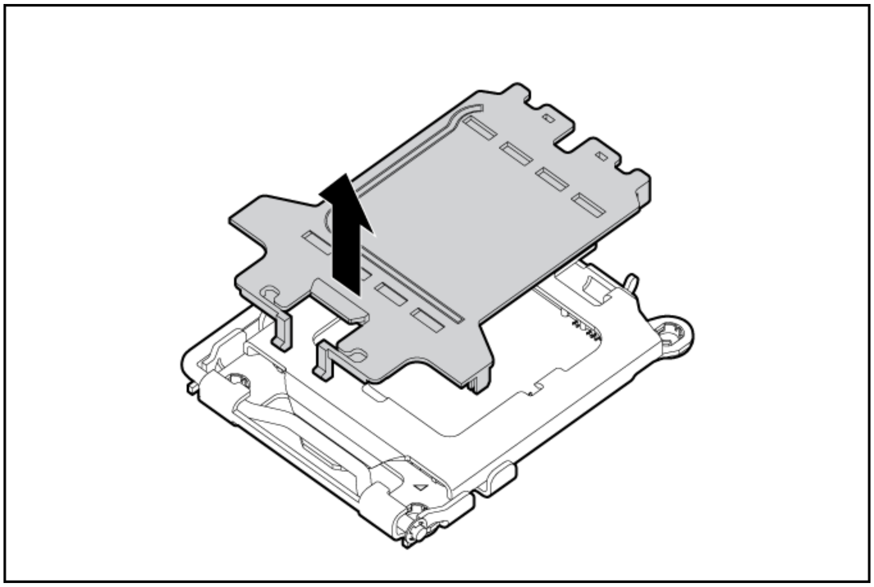
To migrate the processor to the spare system board:

1. Install the spare system board.

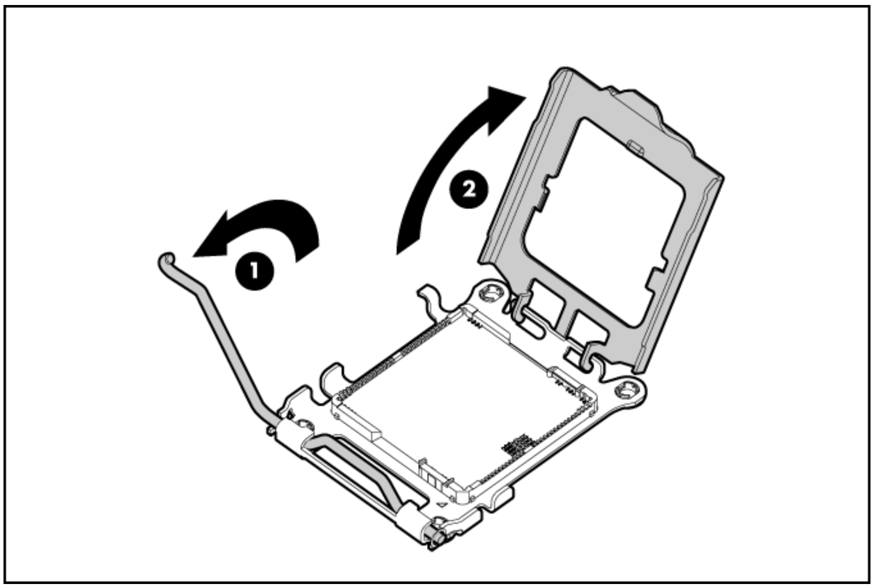
> △ **CAUTION:** The pins on the processor socket are very fragile. Any damage to them may require replacing the system board.

2. Prepare the processor socket on the spare system board:

a. Remove the processor socket protective cover.



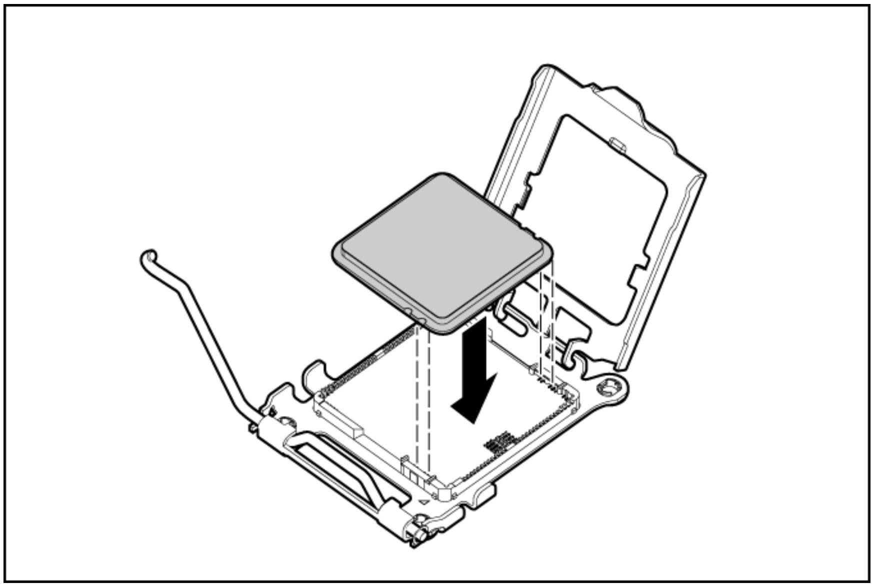
b. Open the processor retaining latch and the processor socket retaining bracket.



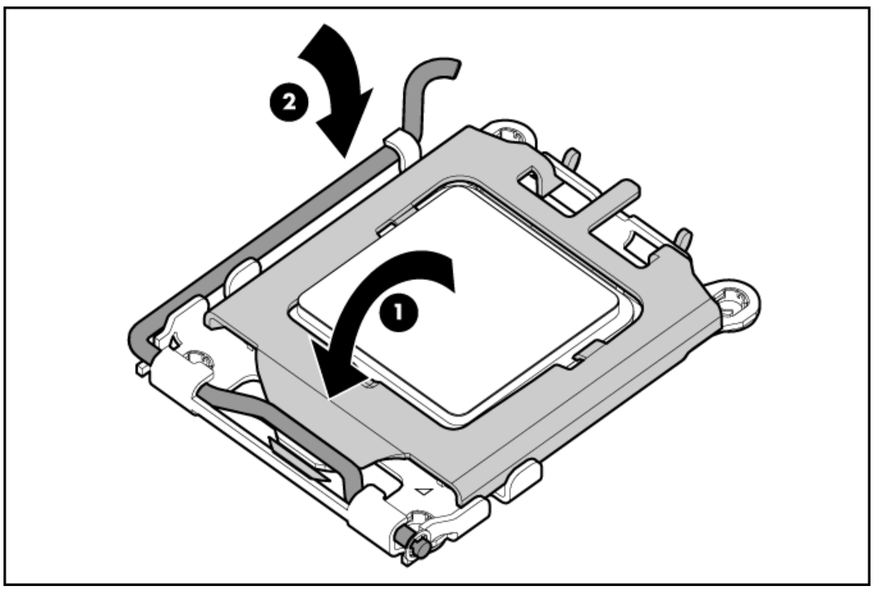
3. Install the processor socket cover onto the processor socket of the failed system board.
4. Install the processor on the spare system board.

> **CAUTION:** The processor is designed to fit one way into the socket. Use the alignment guides on the processor and socket to properly align the processor with the socket. Refer to the server hood label for specific instructions.

> **CAUTION:** Always install the processor parallel to the system board to avoid damage to the pins.

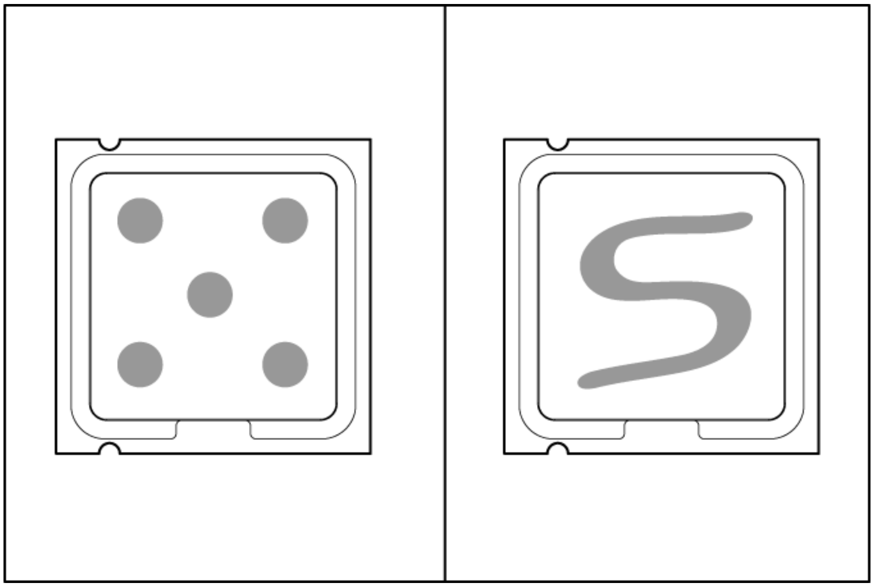


5. Close the processor retaining latch and the processor socket retaining bracket.



6. Clean the old thermal grease from the heatsink and the top of the processor with the alcohol swab. Allow the alcohol to evaporate before continuing.

7. Apply all the grease to the top of the processor in one of the following patterns to ensure even distribution:



8. Install the heatsink ("Heatsink" on page 47).
9. Install all components removed from the failed system board.
10. Install the access panel ("Access panel" on page 30).
11. Install the power supplies.
12. Power up the server.

IMPORTANT: Install all components with the same configuration that was used on the failed system board.

After you replace the system board, you must re-enter the server serial number and the product ID.

1. During the server startup sequence, press the **F9** key to access RBSU.
2. Select the **System Options** menu.
3. Select **Serial Number**. The following warning is displayed:

   ```
   WARNING! WARNING! WARNING! The serial number is loaded into the system
   during the manufacturing process and should NOT be modified. This option
   should only be used by qualified service personnel. This value should
   always match the serial number sticker located on the chassis.
   ```

4. Press the **Enter** key to clear the warning.
5. Enter the serial number and press the **Enter** key.
6. Select **Product ID**.
7. Enter the product ID and press the **Enter** key.
8. Press the **Esc** key to close the menu.
9. Press the **Esc** key to exit RBSU.
10. Press the **F10** key to confirm exiting RBSU. The server will automatically reboot.

I/O fan bracket

To remove the component:

1. Power down the server (on page 28).
2. Remove all power supplies ("Hot-plug power supply" on page 32).
3. Extend or remove the server from the rack ("Extend the server from the rack" on page 27, "Remove the server from the rack" on page 29).
4. Remove the access panel ("Access panel" on page 30).
5. Remove the power supply cage assembly ("Power supply cage assembly" on page 37).
6. Remove the battery pack ("Removing the battery pack" on page 39).
7. Remove the air baffle ("Air baffle" on page 40).
8. Remove the power supply backplane ("Power supply backplane" on page 58).

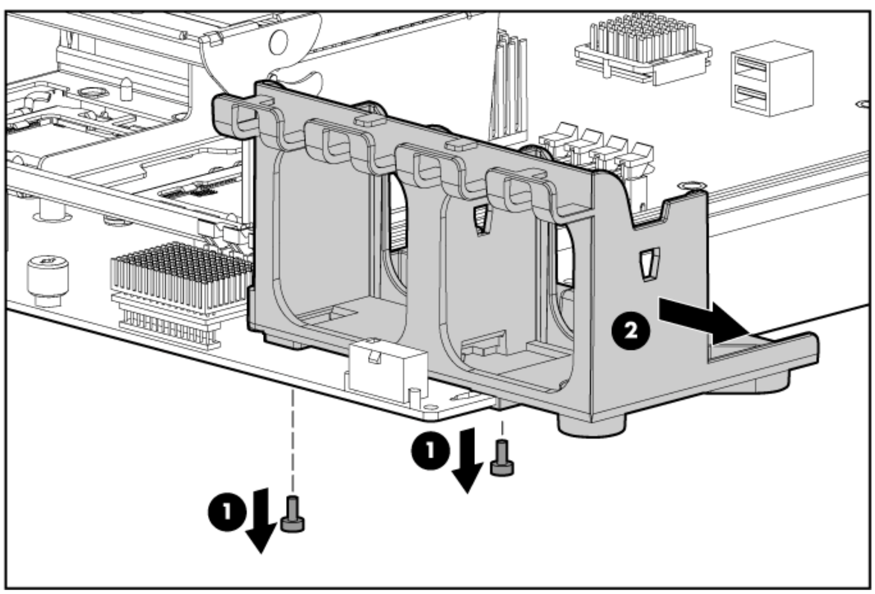
> **CAUTION:** To prevent damage to the server or expansion boards, power down the server and remove all AC power cords before removing or installing the PCI riser cage.

9. Remove the PCI riser cage ("PCI riser cage" on page 60).
10. Remove expansion boards from slots 1 and 2 ("Expansion board (slots 1 and 2)" on page 63).

> **IMPORTANT:** For this procedure, you do not need to remove the hot-plug fans from the processor fan bracket. When reinstalling the processor fan bracket, press the top of each fan to be sure it seats securely.

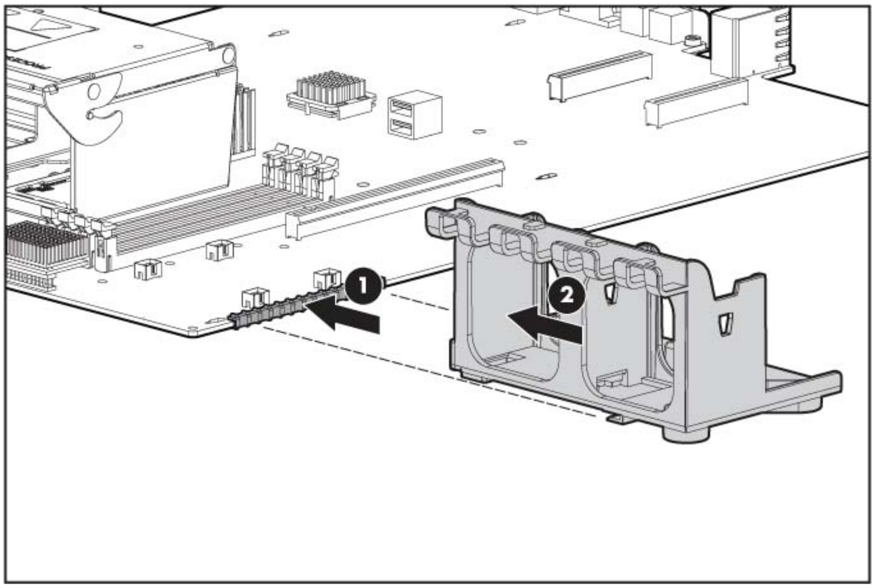
11. Remove the processor fan bracket ("Processor fan bracket" on page 41).
12. Remove the hot-plug fans from the I/O fan bracket ("Hot-plug fan" on page 36).
13. Remove all DIMMs ("DIMMs" on page 55).
14. Remove the system board ("System board" on page 65).
15. Remove the I/O fan bracket.

    For ease of removal, invert the system board.

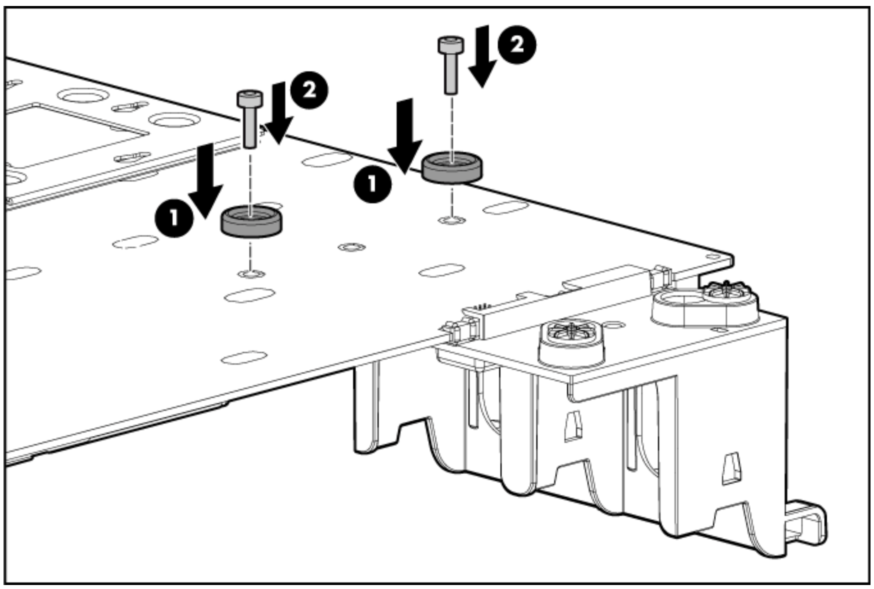


To replace the component:

1. Install the I/O fan bracket.



2. Secure the I/O fan bracket to the system board.



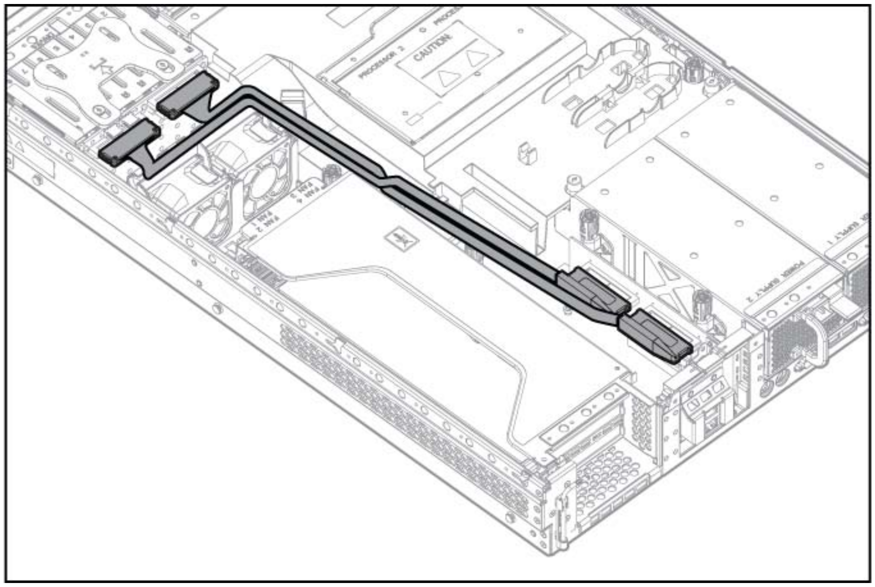
3. Install the system board ("System board" on page 65).
4. Install the DIMMs ("DIMMs" on page 55).
5. Install all hot-plug fans in the I/O fan bracket ("Hot-plug fan" on page 36).
6. Install the processor fan bracket ("Processor fan bracket" on page 41).
7. Install the expansion boards in slot 1 and 2 ("Expansion board (slots 1 and 2)" on page 63).
8. Install the PCI riser cage ("PCI riser cage" on page 60).
9. Install the power supply backplane ("Power supply backplane" on page 58).
10. Install the power supply cage assembly ("Power supply cage assembly" on page 37).
11. Install the air baffle.
12. Install the battery pack ("Removing the battery pack" on page 39).

13. Install the access panel ("Access panel" on page 30).
14. Install the server into the rack.
15. Install the power supplies ("Hot-plug power supply" on page 32).
16. Power up the server.

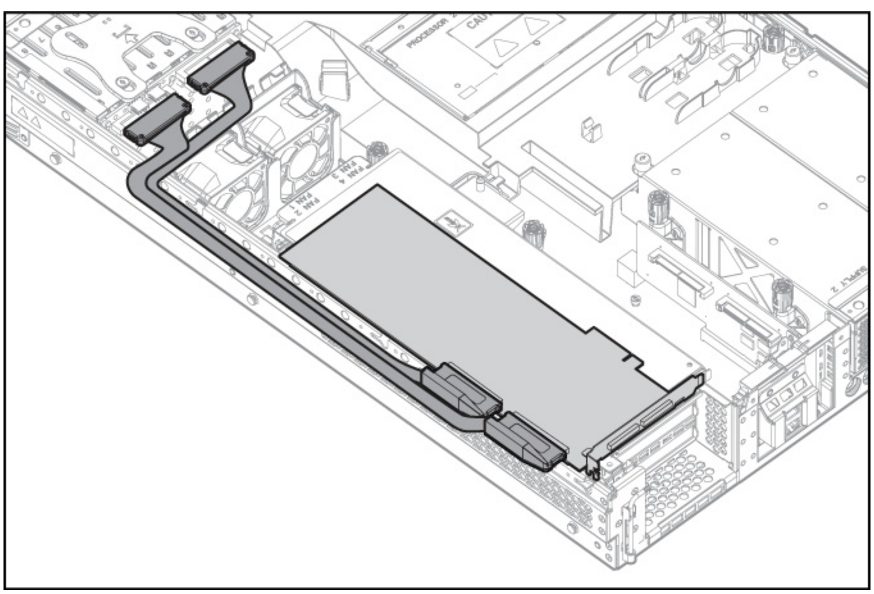
Cabling

SAS hard drive cabling

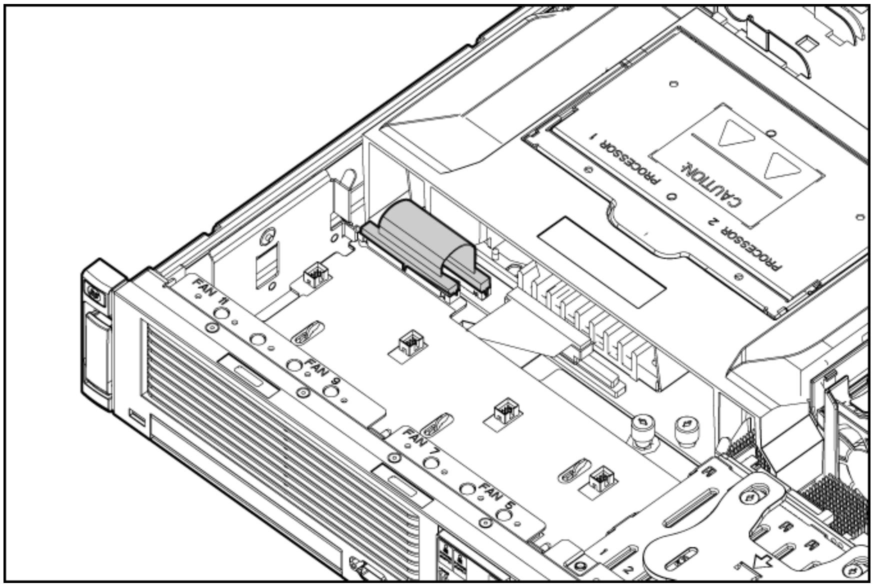
PCI SAS cabling to an HP Smart Array P400i Controller



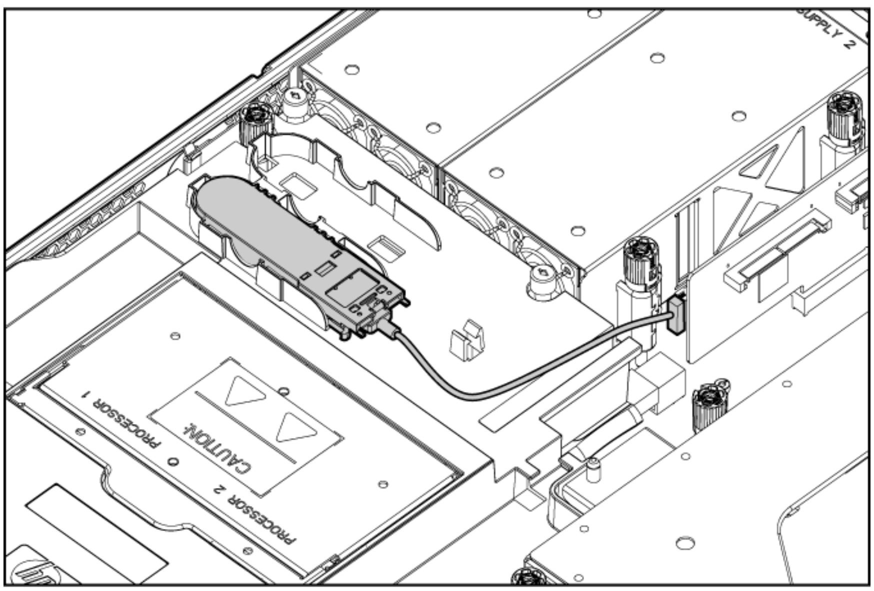
PCI SAS cabling to an optional expansion board controller



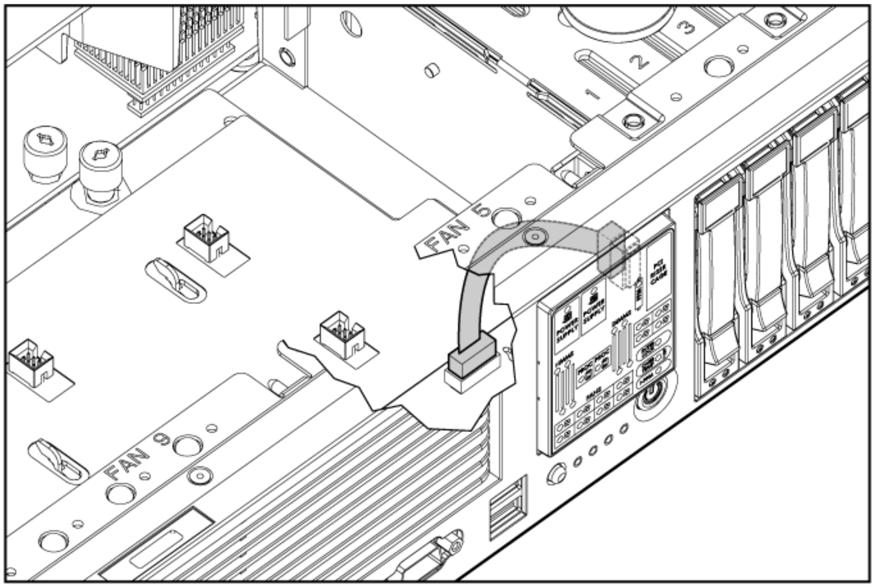
Fan board cabling



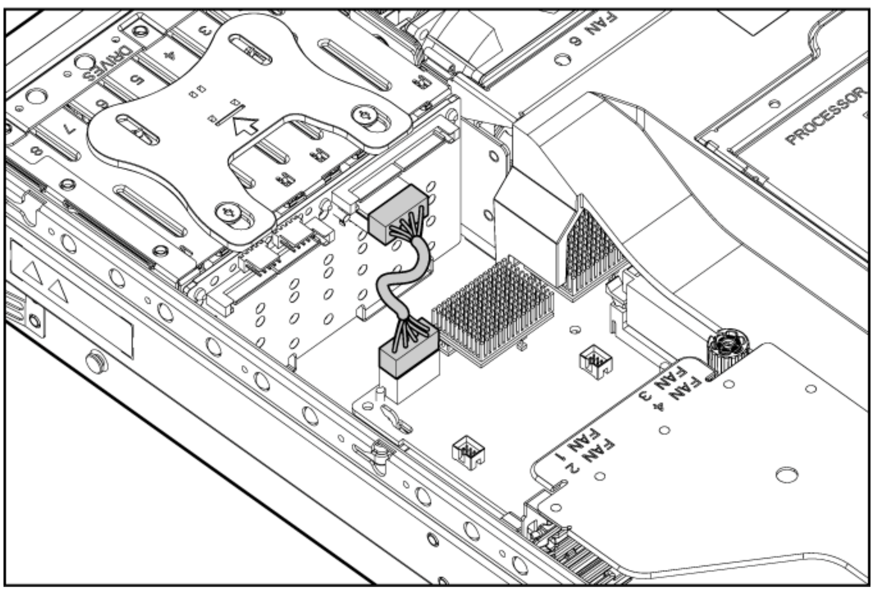
Battery cabling for BBWC



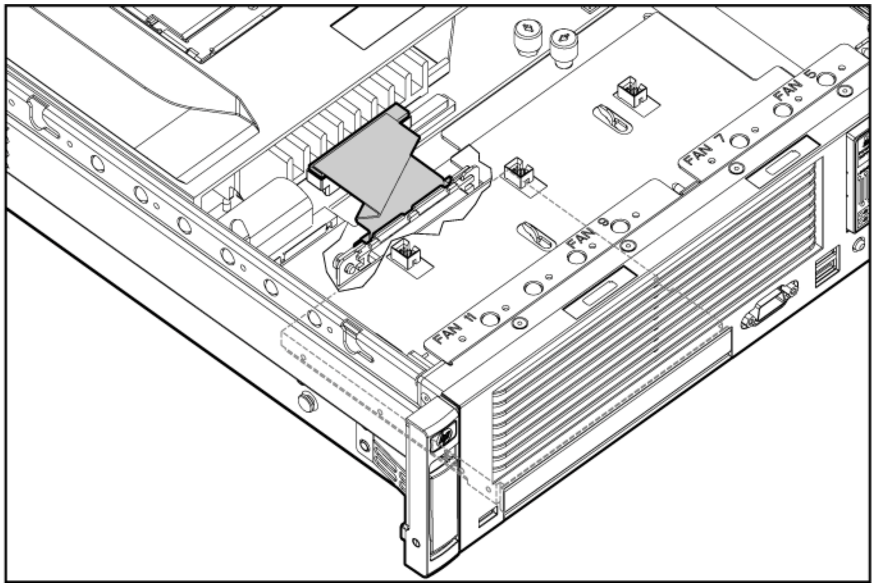
Systems Insight Display cabling



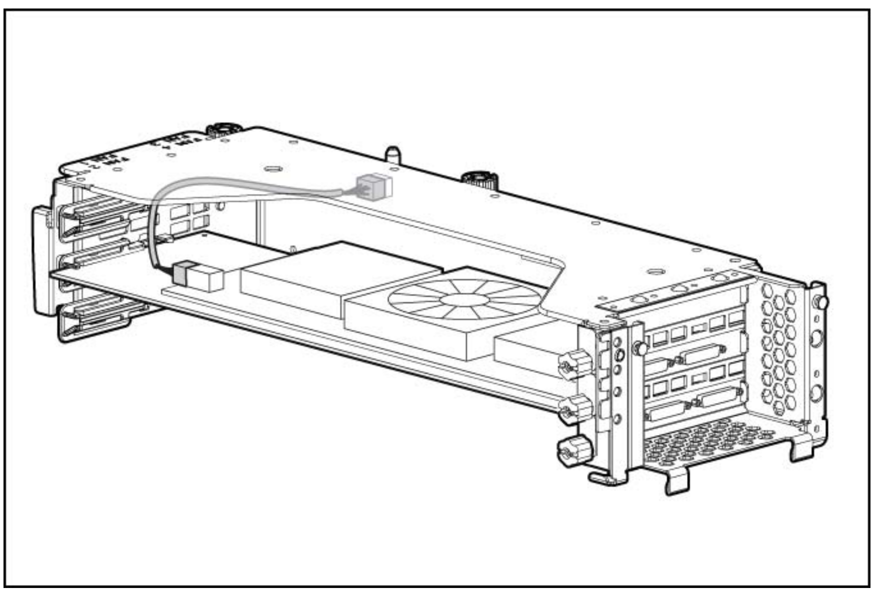
Hard drive backplane power cabling



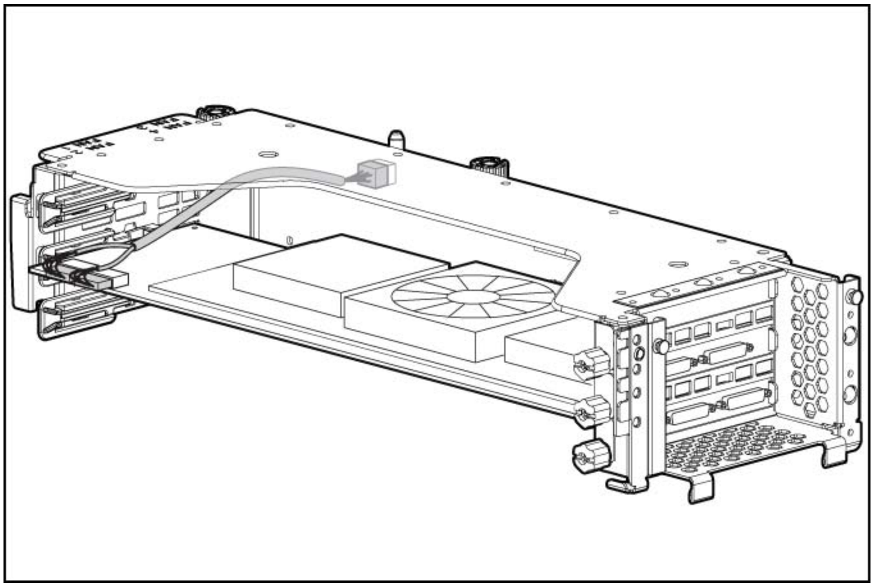
Media drive bay cabling



PCIe x16 riser board power cabling



PCIe x16 (225W) riser board power cabling



Diagnostic tools

Troubleshooting resources

The *HP ProLiant Servers Troubleshooting Guide* provides procedures for resolving common problems and comprehensive courses of action for fault isolation and identification, error message interpretation, issue resolution, and software maintenance on ProLiant servers and server blades. This guide includes problem-specific flowcharts to help you navigate complex troubleshooting processes. To view the guide, select a language:

- English (http://www.hp.com/support/ProLiant_TSG_en)
- French (http://www.hp.com/support/ProLiant_TSG_fr)
- Italian (http://www.hp.com/support/ProLiant_TSG_it)
- Spanish (http://www.hp.com/support/ProLiant_TSG_sp)
- German (http://www.hp.com/support/ProLiant_TSG_gr)
- Dutch (http://www.hp.com/support/ProLiant_TSG_nl)
- Japanese (http://www.hp.com/support/ProLiant_TSG_jp)

Automatic Server Recovery

ASR is a feature that causes the system to restart when a catastrophic operating system error occurs, such as a blue screen, ABEND, or panic. A system fail-safe timer, the ASR timer, starts when the System Management driver, also known as the Health Driver, is loaded. When the operating system is functioning properly, the system periodically resets the timer. However, when the operating system fails, the timer expires and restarts the server.

ASR increases server availability by restarting the server within a specified time after a system hang or shutdown. At the same time, the HP SIM console notifies you by sending a message to a designated pager number that ASR has restarted the system. You can disable ASR from the HP SIM console or through RBSU.

HP Systems Insight Manager

HP SIM is a web-based application that allows system administrators to accomplish normal administrative tasks from any remote location, using a web browser. HP SIM provides device management capabilities that consolidate and integrate management data from HP and third-party devices.

IMPORTANT: You must install and use HP SIM to benefit from the Pre-Failure Warranty for processors, SAS and SATA hard drives, and memory modules.

For additional information, refer to the Management CD in the HP ProLiant Essentials Foundation Pack or the HP SIM website (http://www.hp.com/go/hpsim).

Integrated Management Log

The IML records hundreds of events and stores them in an easy-to-view form. The IML timestamps each event with 1-minute granularity.

You can view recorded events in the IML in several ways, including the following:

- From within HP SIM ("HP Systems Insight Manager" on page 80)
- From within Survey Utility
- From within operating system-specific IML viewers
  - For NetWare: IML Viewer
  - For Windows®: IML Viewer
  - For Linux: IML Viewer Application
- From within the iLO 2 user interface
- From within HP Insight Diagnostics (on page 83)

For more information, refer to the Management CD in the HP ProLiant Essentials Foundation Pack.

Integrated Lights-Out 2 technology

The iLO 2 subsystem is a standard component of selected ProLiant servers that provides server health and remote server manageability. The iLO 2 subsystem includes an intelligent microprocessor, secure memory, and a dedicated network interface. This design makes iLO 2 independent of the host server and its operating system. The iLO 2 subsystem provides remote access to any authorized network client, sends alerts, and provides other server management functions.

Using iLO 2, you can:

- Remotely power up, power down, or reboot the host server.
- Send alerts from iLO 2 regardless of the state of the host server.
- Access advanced troubleshooting features through the iLO 2 interface.
- Diagnose iLO 2 using HP SIM through a web browser and SNMP alerting.

For more information about iLO 2 features (which may require an iLO Advanced Pack or iLO Advanced for BladeSystem license), see the iLO 2 documentation on the Documentation CD or on the HP website (http://www.hp.com/servers/lights-out).

Option ROM Configuration for Arrays

Before installing an operating system, you can use the ORCA utility to create the first logical drive, assign RAID levels, and establish online spare configurations.

The utility also provides support for the following functions:

- Reconfiguring one or more logical drives
- Viewing the current logical drive configuration
- Deleting a logical drive configuration
- Setting the controller to be the boot controller

If you do not use the utility, ORCA will default to the standard configuration.

For more information regarding array controller configuration, refer to the controller user guide.

For more information regarding the default configurations that ORCA uses, refer to the *HP ROM-Based Setup Utility User Guide* on the Documentation CD.

HP ProLiant Essentials Rapid Deployment Pack

The RDP software is the preferred method for rapid, high-volume server deployments. The RDP software integrates two powerful products: Altiris Deployment Solution and the HP ProLiant Integration Module.

The intuitive graphical user interface of the Altiris Deployment Solution console provides simplified point-and-click and drag-and-drop operations that enable you to deploy target servers, including server blades, remotely. It enables you to perform imaging or scripting functions and maintain software images.

For more information about the RDP, refer to the HP ProLiant Essentials Rapid Deployment Pack CD or refer to the HP website (http://www.hp.com/servers/rdp).

HP ROM-Based Setup Utility

RBSU is a configuration utility embedded in ProLiant servers that performs a wide range of configuration activities that can include the following:

- Configuring system devices and installed options
- Enabling and disabling system features
- Displaying system information
- Selecting the primary boot controller
- Configuring memory options
- Language selection

For more information on RBSU, see the *HP ROM-Based Setup Utility User Guide* on the Documentation CD or the HP website (http://www.hp.com/support/smartstart/documentation).

SmartStart software

SmartStart is a collection of software that optimizes single-server setup, providing a simple and consistent way to deploy server configuration. SmartStart has been tested on many ProLiant server products, resulting in proven, reliable configurations.

SmartStart assists the deployment process by performing a wide range of configuration activities, including:

- Configuring hardware using embedded configuration utilities, such as RBSU and ORCA
- Preparing the system for installing "off-the-shelf" versions of leading operating system software
- Installing optimized server drivers, management agents, and utilities automatically with every assisted installation
- Testing server hardware using the Insight Diagnostics Utility ("HP Insight Diagnostics" on page 83)

- Installing software drivers directly from the CD. With systems that have internet connection, the SmartStart Autorun Menu provides access to a complete list of ProLiant system software.
- Enabling access to the Array Configuration Utility, Array Diagnostic Utility, and Erase Utility

SmartStart is included in the HP ProLiant Essentials Foundation Pack. For more information about SmartStart software, refer to the HP ProLiant Essentials Foundation Pack or the HP website (http://h18013.www1.hp.com/products/servers/management/smartstart/index.html).

ROMPaq utility

The ROMPaq utility enables you to upgrade the system firmware (BIOS). To upgrade the firmware, insert a ROMPaq diskette into the diskette drive or ROMPaq USB Key into an available USB port and boot the system. Online versions of the ROMPaq utility are also available for updating the system firmware.

The ROMPaq utility checks the system and provides a choice (if more than one exists) of available firmware revisions.

For more information about the ROMPaq utility, see the HP website (http://www.hp.com/go/support).

System Online ROM flash component utility

The Online ROM Flash Component Utility enables system administrators to efficiently upgrade system or controller ROM images across a wide range of servers and array controllers. This tool has the following features:

- Works offline and online
- Supports Microsoft® Windows NT®, Windows® 2000, Windows Server® 2003, Novell Netware, and Linux operating systems

IMPORTANT: This utility supports operating systems that may not be supported by the server. For operating systems supported by the server, see the HP website (http://www.hp.com/support).

- Integrates with other software maintenance, deployment, and operating system tools
- Automatically checks for hardware, firmware, and operating system dependencies, and installs only the correct ROM upgrades required by each target server

To download the tool and for more information, see the HP website (http://www.hp.com/support).

HP Insight Diagnostics

HP Insight Diagnostics is a proactive server management tool, available in both offline and online versions, that provides diagnostics and troubleshooting capabilities to assist IT administrators who verify server installations, troubleshoot problems, and perform repair validation.

HP Insight Diagnostics Offline Edition performs various in-depth system and component testing while the OS is not running. To run this utility, launch the SmartStart CD.

HP Insight Diagnostics Online Edition is a web-based application that captures system configuration and other related data needed for effective server management. Available in Microsoft® Windows® and Linux versions, the utility helps to ensure proper system operation.

For more information or to download the utility, refer to the HP website (http://www.hp.com/servers/diags).

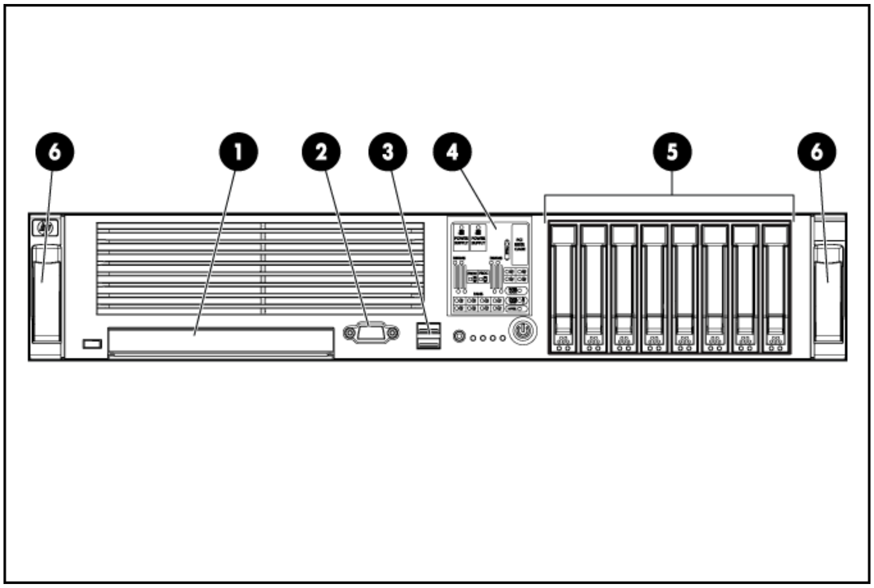
Redundant ROM support

The server enables you to upgrade or configure the ROM safely with redundant ROM support. The server has a 4-MB ROM that acts as two, separate 2-MB ROMs. In the standard implementation, one side of the ROM contains the current ROM program version, while the other side of the ROM contains a backup version.

NOTE: The server ships with the same version programmed on each side of the ROM.

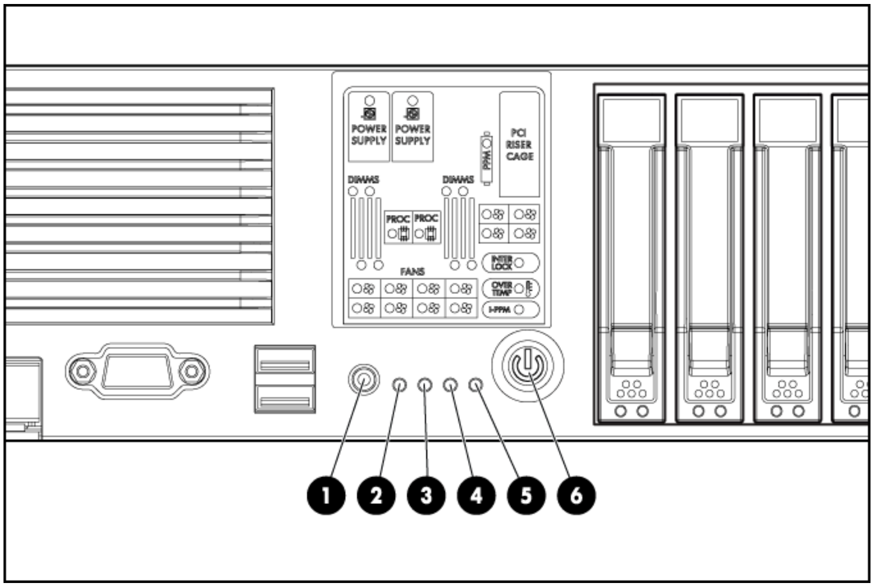
Component identification

Front panel components



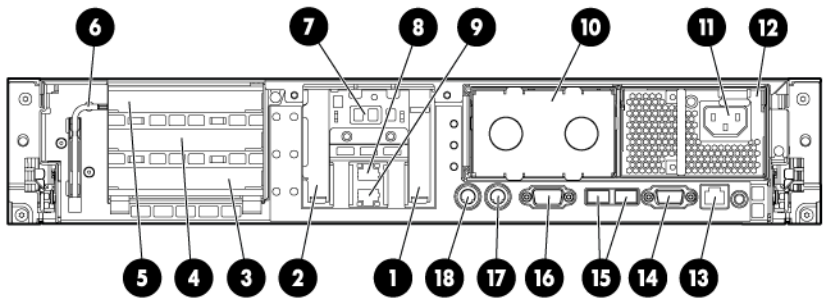
Item	Description
1	Media drive bay (IDE/diskette multibay)
2	Video connector
3	USB connectors (2)
4	Systems Insight Display
5	Hard drive bays
6	Quick release levers (2)

Front panel LEDs and buttons



Item	Description	Status
1	UID LED button	Blue = Activated Flashing = System being remotely managed Off = Deactivated
2	Internal health LED	Green = Normal Amber = System degraded. To identify component in degraded state, refer to Systems Insight Display LEDs (on page 92). Red = System critical. To identify component in critical state, refer to Systems Insight Display LEDs (on page 92).
3	External health LED (power supply)	Green = Normal Amber = Power redundancy failure. To identify component in degraded state, refer to Systems Insight Display LEDs (on page 92). Red = Critical power supply failure. To identify component in critical state, refer to Systems Insight Display LEDs (on page 92).
4	NIC 1 link/activity LED	Green = Network link Flashing = Network link and activity Off = No link to network. If power is off, view the rear panel RJ-45 LEDs for status.
5	NIC 2 link/activity LED	Green = Network link Flashing = Network link and activity Off = No link to network. If power is off, view the rear panel RJ-45 LEDs for status.
6	Power On/Standby button/system power LED	Green = System on Amber = System shut down, but power still applied Off = Power cord not attached or power supply failure

Rear panel components



Item	Description	Color
1	Expansion slot 1	—
2	Expansion slot 2	—
3	Expansion slot 3	—
4	Expansion slot 4	—
5	Expansion slot 5	—
6	T-10/T-15 Torx screwdriver	—
7	External option blank	—
8	NIC 2 connector	—
9	NIC 1 connector	—
10	Power supply bay 2	—
11	Power cord connector	Black
12	Power supply bay 1 (populated)	—
13	iLO 2 connector	—
14	Video connector	Blue
15	USB connectors (2)	Black
16	Serial connector	—
17	Mouse connector	Green
18	Keyboard connector	Purple

PCI expansion slot definitions

Slot	Type and speed
1	PCIe x8
2	PCIe x8

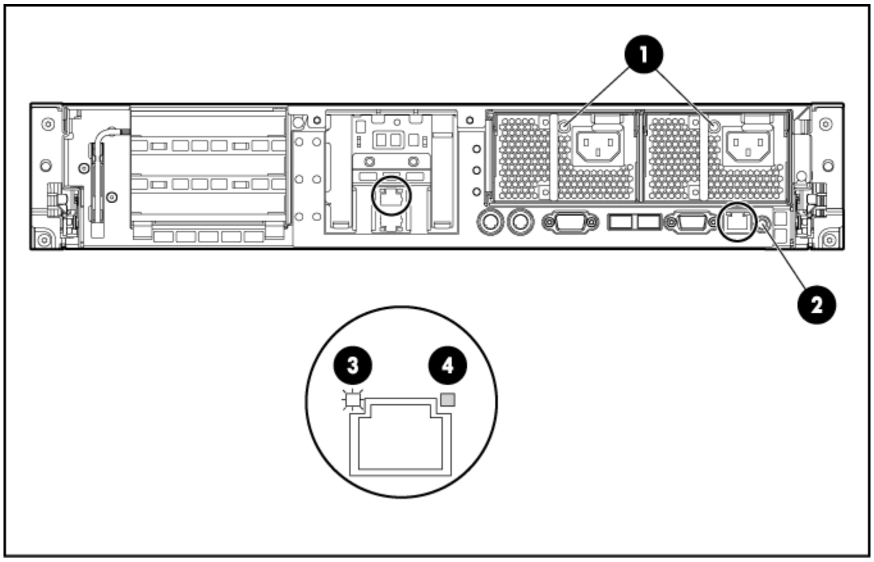
All slots are non-hot-plug.

PCI riser board expansion slot definitions

Slot	PCIe riser board	Mixed PCIe/PCI-X riser board	PCIe x16 riser board
5	x8	64-bit/133-MHz	—
4	x8	64-bit/133-MHz	x16
3	x4	x8	x4

All slots are non-hot-plug.

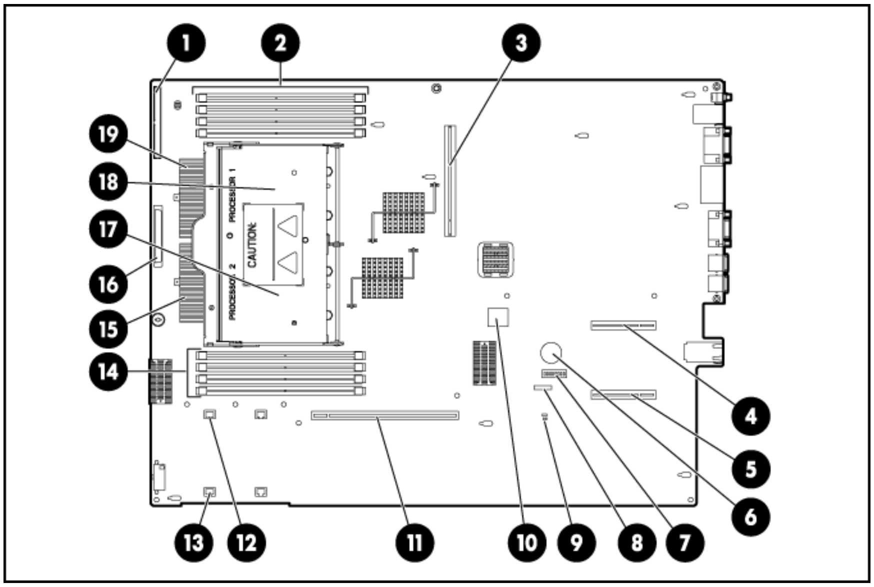
Rear panel LEDs and buttons



Item	Description	Status
1	Power supply LED	Green = Normal Off = System is off or power supply has failed
2	UID LED button	Blue = Activated Flashing = System being remotely managed Off = Deactivated
3	NIC/iLO 2 activity LED	Green = Network activity Flashing = Network activity Off = No network activity
4	NIC/iLO 2 link LED	Green = Network link Off = No network link

System board

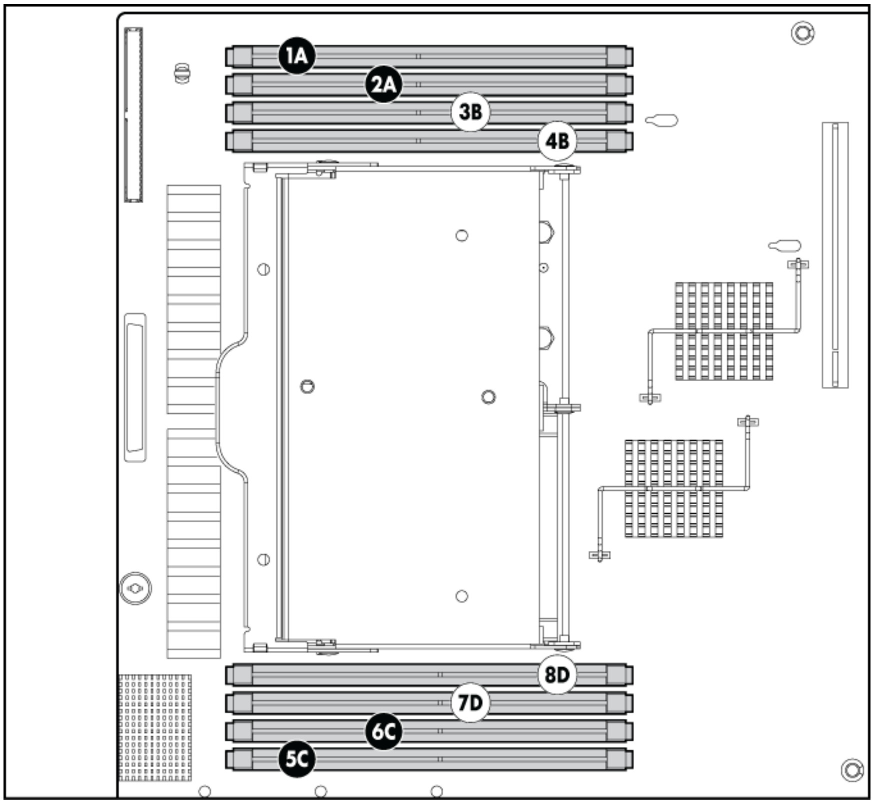
System board components



Item	Description
1	Fan board connector
2	DIMM slots (1-4)
3	Power supply backplane connector
4	PCIe slot 1
5	PCIe slot 2
6	System battery
7	System maintenance switch
8	Diagnostic LEDs
9	NMI jumper
10	Internal USB connector*
11	PCI riser cage connector
12	Fan 2 connector
13	Fan 1 connector
14	DIMM slots (5-8)
15	PPM 2 (embedded)
16	Multibay interface connector
17	Processor socket 2
18	Processor socket 1
19	PPM 1 (embedded)

* The lower USB connector is unavailable.

DIMM slots



Item	Description
1	DIMM slot 1A
2	DIMM slot 2A
3	DIMM slot 3B
4	DIMM slot 4B
5	DIMM slot 5C
6	DIMM slot 6C
7	DIMM slot 7D
8	DIMM slot 8D

System maintenance switch

Position	Default	Function
S1	Off	Off = iLO 2 security is enabled. On = iLO 2 security is disabled.
S2	Off	Off = System configuration can be modified. On = System configuration is locked and cannot be modified.
S3	Off	Reserved
S4	Off	Reserved

Position	Default	Function
S5	Off	Off = Power-on password is enabled. On = Power-on password is disabled.
S6	Off	Off = Normal On = ROM treats system configuration as invalid.
S7	Off	Reserved
S8	Off	Reserved

When the system maintenance switch position 6 is set to the On position, the system is prepared to erase all system configuration settings from both CMOS and NVRAM.

CAUTION: Clearing CMOS and/or NVRAM deletes configuration information. Be sure to properly configure the server or data loss could occur.

NMI functionality

An NMI crash dump enables administrators to create crash dump files when a system is hung and not responding to traditional debug mechanisms.

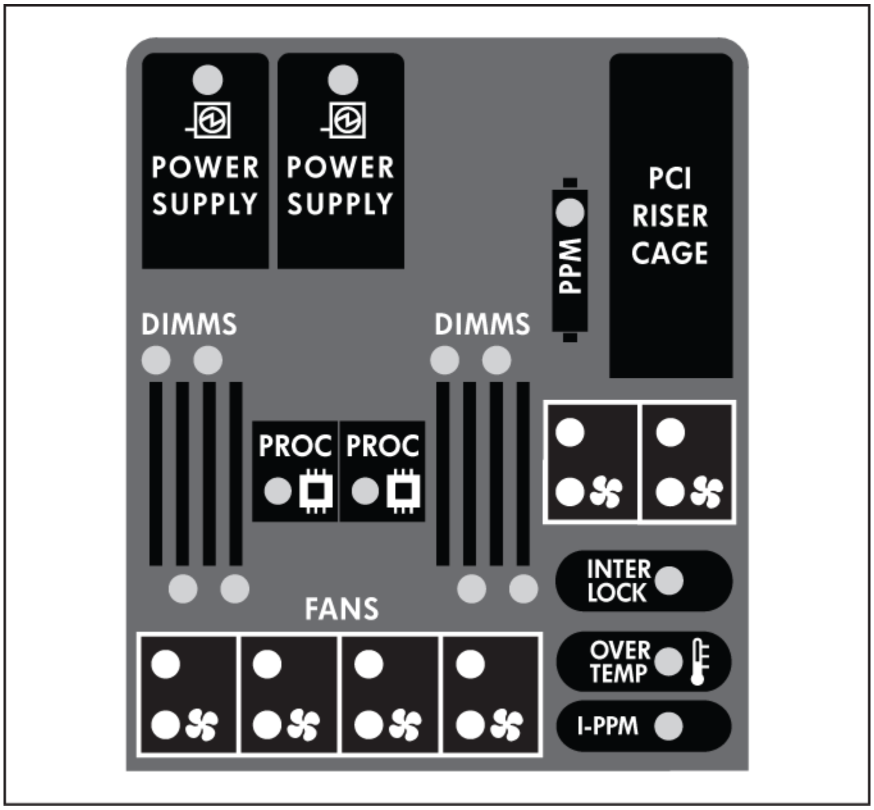
Crash dump log analysis is an essential part of diagnosing reliability problems, such as hangs in operating systems, device drivers, and applications. Many crashes freeze a system, and the only available action for administrators is to cycle the system power. Resetting the system erases any information that could support problem analysis, but the NMI feature preserves that information by performing a memory dump before a hard reset.

To force the OS to invoke the NMI handler and generate a crash dump log, the administrator can do any of the following:

- Short the NMI jumper pins
- Press the NMI switch
- Use the iLO Virtual NMI feature

For additional information, see the whitepaper on the HP website (http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00797875/c00797875.pdf).

Systems Insight Display LEDs



Status
Amber= Failure
Off = Normal

IMPORTANT: If more than one DIMM slot LED is illuminated, further troubleshooting is required. Test each bank of DIMMs by removing all other DIMMs. Isolate the failed DIMM by replacing each DIMM in a bank with a known working DIMM.

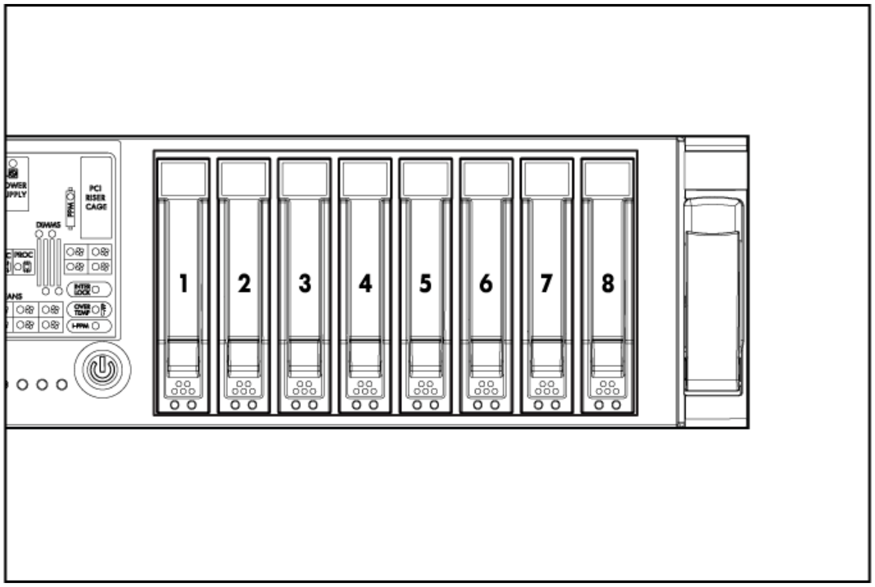
Systems Insight Display LEDs and internal health LED combinations

When the internal health LED on the front panel illuminates either amber or red, the server is experiencing a health event. Combinations of illuminated system LEDs and the internal health LED indicate system status.

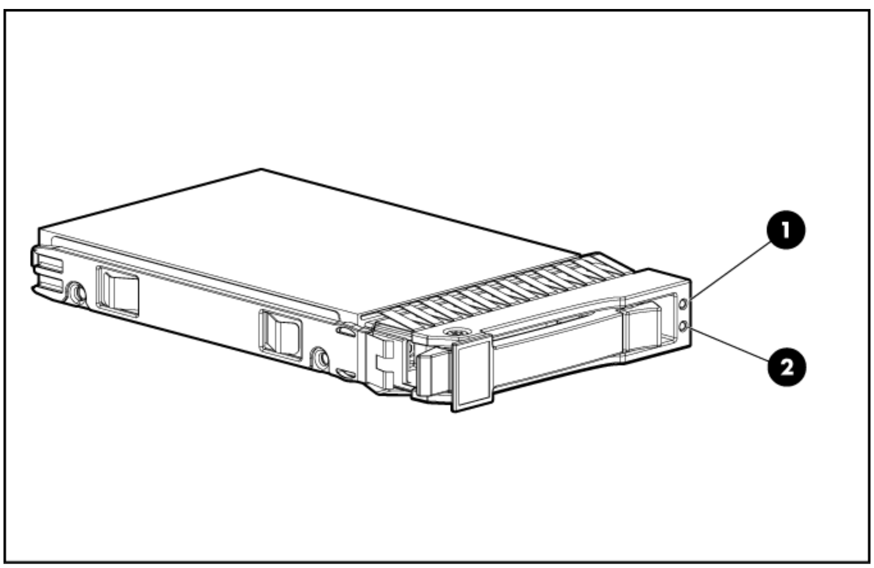
Systems Insight Display LED and color	Internal Health LED color	Status
Processor failure, socket *X* (amber)	Red	One or more of the following conditions may exist: • Processor in socket *X* has failed. • Processor *X* is not installed in the socket. • Processor *X* is unsupported. • ROM detects a failed processor during POST.
	Amber	Processor in socket *X* is in a pre-failure condition.
PPM failure (amber)	Red	One or more of the following conditions may exist: • PPM for processor 2 has failed. • PPM is not installed, but processor 2 is installed.
I-PPM failure (amber)	Red	Embedded I-PPM for processor 1 has failed.
DIMM failure, slot *X* (amber)	Red	One or more of the following conditions may exist: • DIMM in slot *X* has failed. • Memory group is populated with different DIMM types (all DIMMs are mismatched).
	Amber	One or more of the following conditions may exist: • DIMM in slot *X* is in a pre-failure condition. • Memory group is populated with different DIMM types (at least one DIMM is good).
DIMM failure, all slots in one bank (amber)	Red	One or more DIMMs has failed. Test each bank of DIMMs by removing all other DIMMs. Isolate the failed DIMM by replacing each DIMM in a bank with a known working DIMM.
DIMM failure, all slots in all banks (amber)	Red	One or more DIMMs has failed. Test each bank of DIMMs by removing all other DIMMs. Isolate the failed DIMM by replacing each DIMM in a bank with a known working DIMM.
Overtemperature (amber)	Red	The server has detected a hardware critical temperature level.
Fan (amber)	Amber	One fan has failed in redundant mode.
	Red	One or more of the following conditions may exist: • One fan has failed in non-redundant mode • The minimum fan requirements are not being met. Two or more fans have failed or are missing.

Systems Insight Display LED and color	Internal Health LED color	Status
Power supply *X* (amber)	Red	Power supply *X* has failed.
PCI riser cage interlock (amber)	—	PCI riser cage is unseated.

Device numbers



SAS and SATA hard drive LEDs



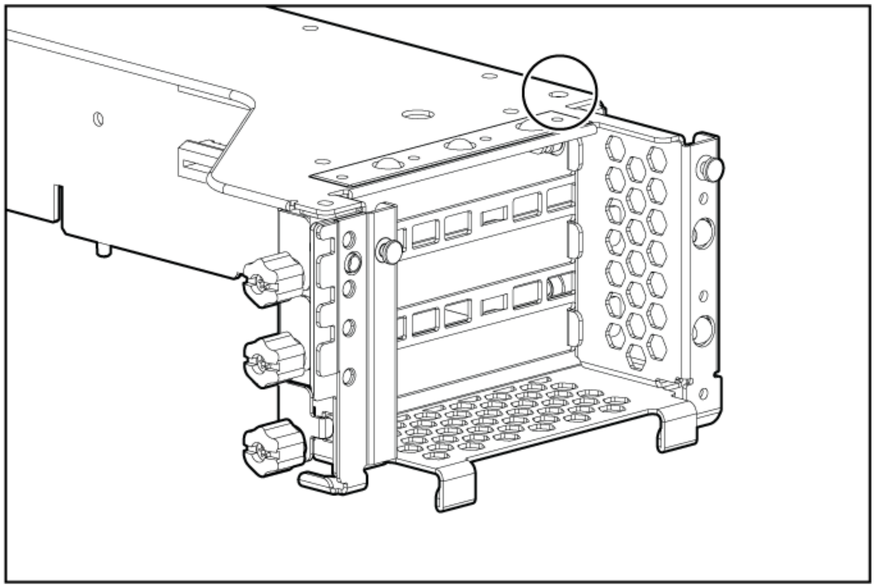
Item	Description
1	Fault/UID LED (amber/blue)
2	Online LED (green)

SAS and SATA hard drive LED combinations

Online/activity LED (green)	Fault/UID LED (amber/blue)	Interpretation
On, off, or flashing	Alternating amber and blue	The drive has failed, or a predictive failure alert has been received for this drive; it also has been selected by a management application.
On, off, or flashing	Steadily blue	The drive is operating normally, and it has been selected by a management application.
On	Amber, flashing regularly (1 Hz)	A predictive failure alert has been received for this drive. Replace the drive as soon as possible.
On	Off	The drive is online, but it is not active currently.
Flashing regularly (1 Hz)	Amber, flashing regularly (1 Hz)	**Do not remove the drive. Removing a drive may terminate the current operation and cause data loss.** The drive is part of an array that is undergoing capacity expansion or stripe migration, but a predictive failure alert has been received for this drive. To minimize the risk of data loss, do not replace the drive until the expansion or migration is complete.
Flashing regularly (1 Hz)	Off	**Do not remove the drive. Removing a drive may terminate the current operation and cause data loss.** The drive is rebuilding, or it is part of an array that is undergoing capacity expansion or stripe migration.
Flashing irregularly	Amber, flashing regularly (1 Hz)	The drive is active, but a predictive failure alert has been received for this drive. Replace the drive as soon as possible.
Flashing irregularly	Off	The drive is active, and it is operating normally.
Off	Steadily amber	A critical fault condition has been identified for this drive, and the controller has placed it offline. Replace the drive as soon as possible.
Off	Amber, flashing regularly (1 Hz)	A predictive failure alert has been received for this drive. Replace the drive as soon as possible.
Off	Off	The drive is offline, a spare, or not configured as part of an array.

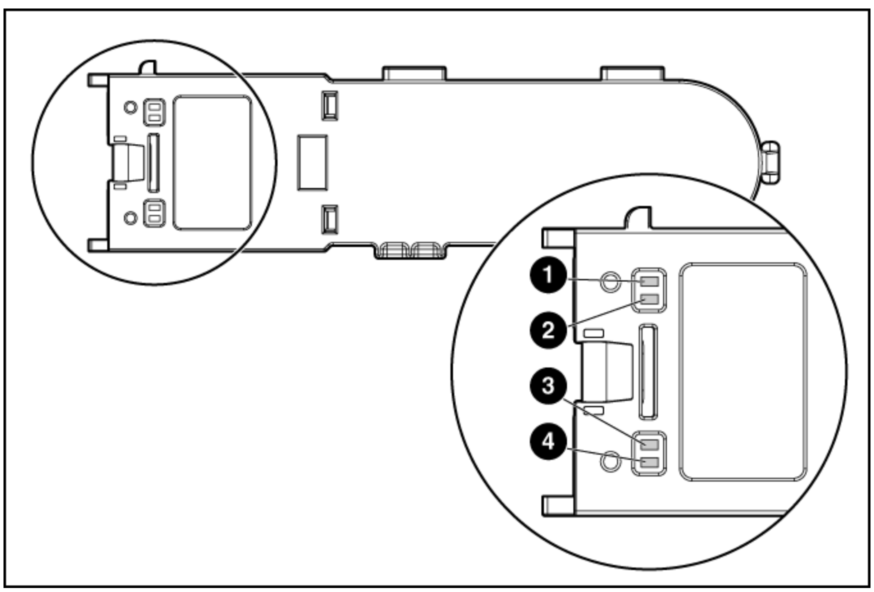
PCI riser cage LED

△ **CAUTION:** To prevent damage to the server or expansion boards, power down the server and remove all AC power cords before removing or installing the PCI riser cage.



Status
On = AC power connected
Off = AC power disconnected

Battery pack LEDs



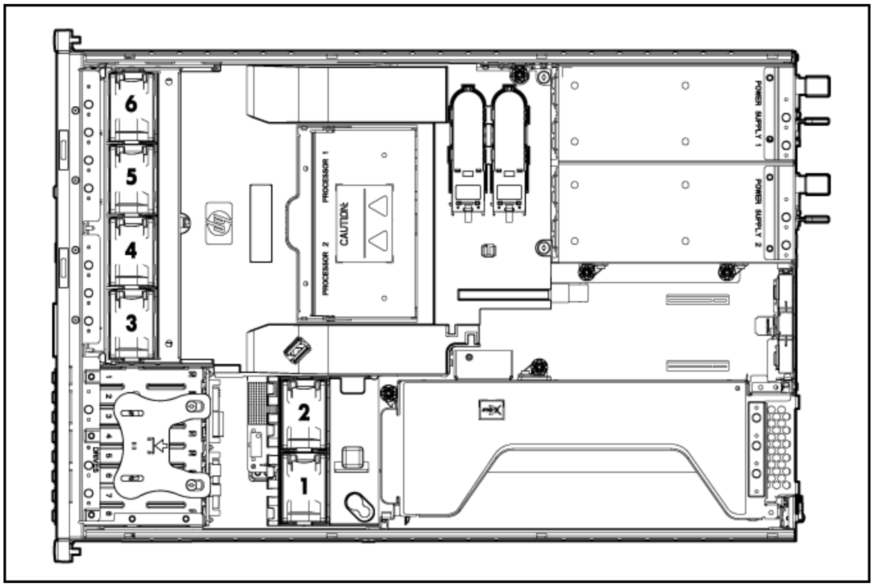
Item ID	Color	Description
1	Green	System Power LED. This LED glows steadily when the system is powered up and 12 V system power is available. This power supply is used to maintain the battery charge and provide supplementary power to the cache microcontroller.

Item ID	Color	Description
2	Green	Auxiliary Power LED. This LED glows steadily when 3.3V auxiliary voltage is detected. The auxiliary voltage is used to preserve BBWC data and is available any time that the system power cords are connected to a power supply.
3	Amber	Battery Health LED. To interpret the illumination patterns of this LED, see the following table.
4	Green	BBWC Status LED. To interpret the illumination patterns of this LED, see the following table.

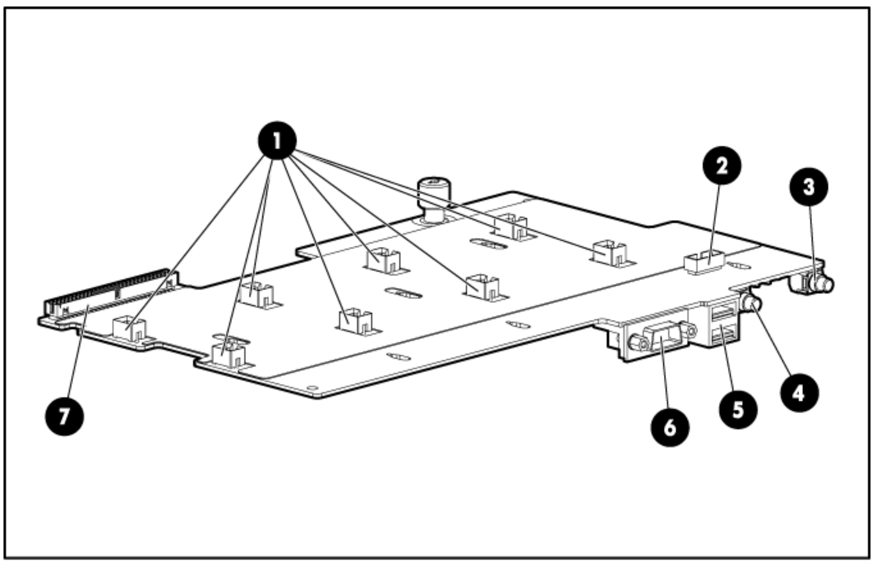
LED3 pattern	LED4 pattern	Interpretation
—	One blink every two seconds	The system is powered down, and the cache contains data that has not yet been written to the drives. Restore system power as soon as possible to prevent data loss. Data preservation time is extended any time that 3.3 V auxiliary power is available, as indicated by LED 2. In the absence of auxiliary power, battery power alone preserves the data. A fully-charged battery can normally preserve data for at least two days. The battery lifetime also depends on the cache module size. For further information, refer to the controller QuickSpecs on the HP website (http://www.hp.com).
—	Double blink, then pause	The cache microcontroller is waiting for the host controller to communicate.
—	One blink per second	The battery pack is below the minimum charge level and is being charged. Features that require a battery (such as write cache, capacity expansion, stripe size migration, and RAID migration) are temporarily unavailable until charging is complete. The recharge process takes between 15 minutes and two hours, depending on the initial capacity of the battery.
—	Steady glow	The battery pack is fully charged, and posted write data is stored in the cache.
—	Off	The battery pack is fully charged, and there is no posted write data in the cache.
One blink per second	One blink per second	An alternating green and amber blink pattern indicates that the cache microcontroller is executing from within its boot loader and receiving new flash code from the host controller.
Steady glow	—	There is a short circuit across the battery terminals or within the battery pack. BBWC features are disabled until the battery pack is replaced. The life expectancy of a battery pack is typically more than three years.
One blink per second	—	There is an open circuit across the battery terminals or within the battery pack. BBWC features are disabled until the battery pack is replaced. The life expectancy of a battery pack is typically more than three years.

Hot-plug fans

The fan configuration operates in redundant mode only when all six fans are installed.



Fan board components



Item	Description
1	Fan connectors
2	Systems Insight Display connector
3	Power On/Standby button/system power LED
4	UID LED button
5	USB connectors (2)
6	Video connector
7	Fan board system connector

Specifications

Environmental specifications

Specification	Value
Temperature range*	
Operating	10°C to 35°C (50°F to 95°F)
Shipping	-30°C to 50°C (-22°F to 122°F)
Storage	-30°C to 60°C (-22°F to 140°F)
Maximum wet bulb temperature	28°C (82.4°F)
Relative humidity (noncondensing)**	
Operating	10% to 90%
Non-operating	5% to 95%

* All temperature ratings shown are for sea level. An altitude derating of 1°C per 300 m (1.8°F per 1,000 ft) to 3048 m (10,000 ft) is applicable. No direct sunlight allowed.
** Storage maximum humidity of 95% is based on a maximum temperature of 45°C (113°F). Altitude maximum for storage corresponds to a pressure minimum of 70 KPa.

Server specifications

Specification	Value
Dimensions	
Height	8.59 cm (3.38 in)
Depth	66.07 cm (26.01 in)
Width	44.54 cm (17.54 in)
Weight (maximum)	27.22 kg (60 lb)
Weight (no drives installed)	20.41 kg (47.18 lb)
Input requirements	
Rated input voltage	100 to 132 VAC, 200 to 240 VAC
Rated input frequency	50 Hz to 60 Hz
Rated input current	10 A at 100 VAC 4.9 A at 200 VAC
Rated input power	980 W at 100V AC input 960 W at 200V AC input

BTUs per hour	3344 at 100V to 120V AC input 3277 at 200V to 240V AC input
Power supply output	
Rated steady-state power	800 W at 100V AC input 850 W at 120V AC input 1000 W at 200V to 240V AC input
Maximum peak power	800 W at 100V AC input 850 W at 120V AC input 1000 W at 200V to 240V AC input

Hot-plug power supply calculations

For hot-plug power supply specifications and calculators to determine electrical and heat loading for the server, refer to the HP Enterprise Configurator website (http://h30099.www3.hp.com/configurator/).

DDR2 SDRAM DIMM specifications

△ **CAUTION:** Be sure to install DIMMs in the proper configuration. Refer to the Documentation CD.

Specification	Value
Size	512 MB, 1 GB, 2 GB, 4GB, 8 GB
Width	72 bits
Upgrade requirement *	Any combination of like-paired DDR2 DIMMs that provide a minimum of 512 MB

*Use only 512-MB, 1-GB, 2-GB, 4-GB, or 8-GB, 72-bit wide, 1.8-V, PC2-5300 Registered ECC DDR2 DIMMs. Use HP DDR2 DIMMs only.

1.44-MB diskette drive specifications

Specification	Value
Dimensions	
Height	12.7 mm (0.5 in)
Width	96 mm (3.8 in)
Depth	130 mm (5.1 in)
LEDs (front panel)	Green = On
Read/write capacity per diskette	
High density	1.44 MB

Specification	Value
Low density	720 KB
Drives supported	1
Drive height	One-third height
Drive rotation	300 rpm
Transfer rate	
High	500 Kb/s
Low	250 Kb/s
Bytes/sector	512
Sectors per track (high/low)	18/9
Tracks per side (high/low)	80/80
Access times	
Track-to-track (high/low)	3 ms/6 ms
Average (high/low)	169 ms/94 ms
Setting time	15 ms
Latency average	100 ms
Cylinders (high/low)	80/80
Read/write heads	2

CD-ROM drive specifications

Specification	Value
Disk formats	CD-ROM (modes 1 and 2); mixed mode (audio and data combined); CD-DA; Photo CD (single/multiple-session), CD-XA ready; CDi ready
Capacity	550 MB (mode 1, 12 cm)
	640 MB (mode 2, 12 cm)
Block size	2368, 2352 bytes (mode 0)
	2352, 2340, 2336, 2048 bytes (mode 1)
	2352, 2340, 2336, 2048 bytes (mode 2)
Dimensions	
Height	12.7 mm (0.50 in)
Depth	132.08 mm (5.20 in)
Width	132.08 mm (5.20 in)
Weight	0.34 kg (0.75 lb)
Data transfer rate	
Sustained	150 KB/s (sustained 1X), 1500/3600 KB/s (10X to 24X)
Burst	16.6 MB/s
Access times (typical)	
Full stroke	300 ms
Random	140 ms

Specification	Value
Diameter	12 cm, 8 cm (4.70 in, 3.15 in)
Thickness	1.2 mm (0.05 in)
Track pitch	1.6 μm (6.3 × 10^{-7} in)
Cache/buffer	128 KB
Startup time	< 10 s
Stop time	< 5 s (single); < 30 s (multisession)
Laser parameters	
Type	Semiconductor laser GaAs
Wave length	700 ± 25 nm
Divergence angle	53.5° ± 1.5°
Output power	0.14 mW
Operating conditions	
Temperature	5°C to 45°C (41°F to 118°F)
Humidity	5% to 90%

DVD-ROM drive specifications

Specification	Value
Disk formats	DVD (single and double layer), DVD-5, DVD-9, DVD-10, DVD-R, CD-ROM Mode 1 & 2, CD-DA, CD-XA (Mode 2, Form 1 & 2), CD-I (Mode 2, Form 1 & 2), CD-I ready, CD-Bridge, CD-R, PhotoCD (single and multi-session)
Capacity	4.7 GB (DVD-5), 8.5 GB (DVD-9), 9.4 GB (DVD10), 550 Mb (Mode 1, 12 cm), 640 Mb (Mode 2, 12 cm), 180 Mb (8 cm)
Block size	2352 bytes (mode 0) 2352, 2340, 2336, 2048 bytes (mode 1) 2352, 2340, 2336, 2048 bytes (mode 2) 2048 bytes (DVD)
Dimensions	
Height	12.7 mm (0.50 in)
Depth	132.08 mm (5.20 in)
Width	132.08 mm (5.20 in)
Weight	0.34 kg (0.75 lb)
Data transfer rate	
Sustained	4463 - 10,800 KB/s (8X CAV DVD mode), 150 KB/s (sustained 1X CD-ROM), 1552 3600 KB/s (24X CAV CD-ROM)
Burst	16.6 MB/s with DMA support
Access times (typical)	
Full stroke	<200 ms CD <300 ms DVD
Random	<110 ms CD <180 ms DVD

Specification	Value
Diameter	12 cm, 8 cm (4.70 in, 3.15 in)
Thickness	1.2 mm (0.05 in)
Track pitch	0.74 μm (3.15 $\times 10^{-7}$ in) DVD-ROM 1.6 μm (6.3 $\times 10^{-7}$ in) CD-ROM
Cache/buffer	128 KB
Startup time	< 10 s
Stop time	< 5 s (single); < 30 s (multisession)
Laser parameters	
Type	Semiconductor laser GaAs
Wave length	700 ± 25 nm
Divergence angle	53.5° ± 1.5°
Output power	0.14 mW
Operating conditions	
Temperature	5°C to 45°C (41°F to 118°F)
Humidity	5% to 90%

SAS and SATA hard drive specifications

Item	36-GB SAS drive	72-GB SAS drive	60-GB SATA drive
Capacity	36,420 MB	73,408 MB	60,022 MB
Height	15 mm	15 mm	9 mm
Interface	SAS	SAS	Serial ATA
Transfer rate	3 GB/sec	3 GB/sec	1.5 GB/sec
Rotational speed	10,000 rpm	10,000 rpm	5,400 rpm
Bytes per sector	512	512	512
Logical blocks	71,132,960	143,374,737	117,231,408
Operating temperature	10°C to 35°C (50°F to 95°F)	10°C to 35°C (50°F to 95°F)	10°C to 35°C (50°F to 95°F)

Acronyms and abbreviations

ABEND
abnormal end

ASR
Automatic Server Recovery

BBWC
battery-backed write cache

BIOS
Basic Input/Output System

CMOS
complementary metal-oxide semiconductor

DDR
double data rate

DIMM
dual inline memory module

IDE
integrated device electronics

iLO 2
Integrated Lights-Out 2

IML
Integrated Management Log

LED
light-emitting diode

NMI
non-maskable interrupt

NVRAM

non-volatile memory

ORCA

Option ROM Configuration for Arrays

PCI

peripheral component interface

PCI Express

Peripheral Component Interconnect Express

PCI-X

peripheral component interconnect extended

PCIe

peripheral component interconnect express

POST

Power-On Self Test

PPM

processor power module

RBSU

ROM-Based Setup Utility

RDP

Rapid Deployment Pack

SAS

serial attached SCSI

SATA

serial ATA

SDRAM

synchronous dynamic RAM

SNMP

Simple Network Management Protocol

UID

unit identification

USB

universal serial bus

Index

I

K

L

M

N

O

P

R

S

T

U

V

W